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# NetworkWorld

June 5, 2000 Volume 17, Number 23

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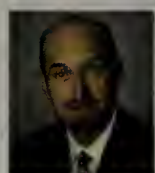
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## Reality Check Programs Separate Fact from Fiction

Network World's Reality Check series takes a hard look at emerging trends and technologies, letting you see beyond the veil of hype to find out what's real and what's not. These FREE events bring together top-notch industry analysts with the market's most innovative vendors to dispel the myths and deliver the data you need to make the business-critical decisions required of you as an IT professional.

## Learn from the Leader



Jim Metzler

**Dr. Jim Metzler** is a founding member of Ashton, Metzler & Associates, an industry-leading consulting group focused on assisting organizations

in improving their performance by leveraging Information Technology and Human Resources. With more than 28 years of professional experience, Jim has aided many vendors in refining product strategies, and has assisted over 100 enterprises in evolving their network infrastructure. His areas of expertise are software tool development, network design and hardware product management, and engineering management for high-speed data services. He is a dynamic and experienced presenter who conducts tutorials on both local- and wide-area networking throughout the U.S. and Europe, and is on staff at Northeastern University's State-of-the-Art Program in Networking. Together with Lynn DeNoia he has published *Layer 3 Switching: A Guide for IT Professionals*.

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## The Hype

Some say adopting an Application Service Provider (ASP) model for application outsourcing will radically change the way most organizations do computing. With offerings ranging from traditional services such as payroll, human resources and accounting, to advanced applications like inventory management, Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM), it sure sounds like ASPs could save your company time and money. But how will they affect your network and your IT organization? ASPs are not created equal and they're not for everyone. But there may be one out there that will enhance your organization's network capabilities and help you gain a competitive edge.

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- Why the ASP Supply Chain and its components are so important
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- To what degree you can expect security, application control — even your own career — to be affected by this new relationship

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PDA's, Web phones and palm-sized computers are embracing Java. **PAGE 8.**

June 5, 2000 Volume 17, Number 23

The network portal: [www.nwfusion.com](http://www.nwfusion.com)

## Managing mergers



Whether your firm is negotiating a megabucks merger or is vulnerable to getting gobbled up by a competitor, we'll tell you how to quickly integrate IT systems so the new company can get on with business. **Page 68.**

BENJAMIN LAVENDER

## New tools tame Napster traffic

*Traffic shapers offer relief from new 'Net apps.*

BY CAROLYN DUFFY MARSAN

New traffic-shaping devices promise to prevent Napster and similar bandwidth hogs from overwhelming campus and corporate networks, an advancement early adopters say will loosen bans on these increasingly popular Internet applications.

Among the colleges recently lifting restrictions to Napster are Plattsburgh State University, Buffalo State College, Williams College, College of St. Benedict and St. John's University, which have all purchased network traffic shapers to classify and control Napster and other network applications. Napster lets users share digital music files

over the Internet.

The experience colleges have had taming Napster offers an important lesson to corporate network managers facing similar threats from other bandwidth-intensive applications such as Gnutella, iMesh, Freenet and CuteMX. All these applications let users swap large files including **Napster**, page 119

## Can the EMA come back?

*Once influential messaging industry group trying to turn around fortunes.*

BY JOHN FONTANA

The association that guided electronic messaging through its formative years and helped turn it into a business staple is now struggling for survival and trying to redefine itself.

The Electronic Messaging Association (EMA), once the preeminent messaging industry group, is battling industry change and three years of what some call mismanagement. The organization's annual confer-

ence in April was poorly attended, and critics took that as a sign that the EMA was on its deathbed.

But the EMA, which now calls itself the E-Business Forum, says it is simply an organization in transition. The Forum is defining messaging's role in e-commerce as manifest in technologies such as directories, security, supply-chain management and Web services. Some say, however, that the EMA has lost focus

and won't survive the year unless it can clearly articulate See **EMA**, page 120

### The Edge

Covering developments at the seam between enterprise and public networks.

#### Stories this week:

- New gear targets speeds between T-1 and T-3.
- Cabletron's Riverstone spinoff aims to supercharge metropolitan-area nets.

New section!  
See page 49.

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### HELP DESK

Learn how to control Napster and Real traffic on your network.

**DocFinder**  
find it 8432 online

## Second line of defense

New firewalls emerge

BY ELLEN MESSMER

to handle what traditional ones can't.

The firewall has traditionally served as the sentry between the outside world of the Internet and the internal corporate network. But the next generation of firewalls will be inside the corporate network's perimeter on Web servers, PCs, modems and silicon chips.

See **Firewalls**, page 20



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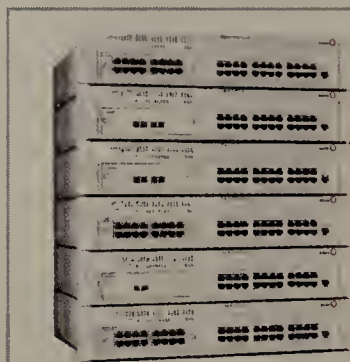


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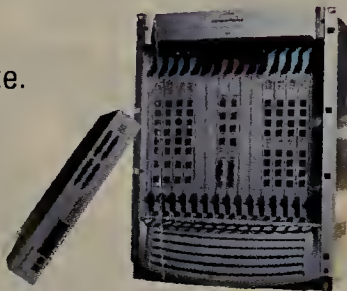
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SPECIAL FOCUS: VOICE OVER DSL. *Early adopters sing the praises of voice over DSL.* **Page 44.**

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# INTEGRATING IT



*The success of a corporate merger or acquisition hinges on the ability of IT to quickly consolidate systems. Here's what American Electric Power, Cisco and First Union Bank do to ensure their companies' deals pay dividends.* **Page 68.**

**Motivating the troops:** *How to prevent your staff from fleeing once they catch wind of a pending deal.* **Page 83.**

## Reviews

- **VoIP gateways:** We looked at three voice-over-IP gateways, and the ORCA GX-8 from Nuera Communications was the winner. Cisco's AS 5300 gateway came in a close second. **Page 77.**



## Management

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**Editorial:** Spit out of the Vortex. **Page 66.**

**Chuck Yoke:** Best technology is not always the best business choice. **Page 67.**

**Linda Musthaler:** ASP model gets high marks. **Page 67.**

**Backspin:** Crazy and customers: More chaos. **Page 126.**

**'Net Buzz:** Start-up WebMiles looks to one-up frequent flier programs. **Page 126.**

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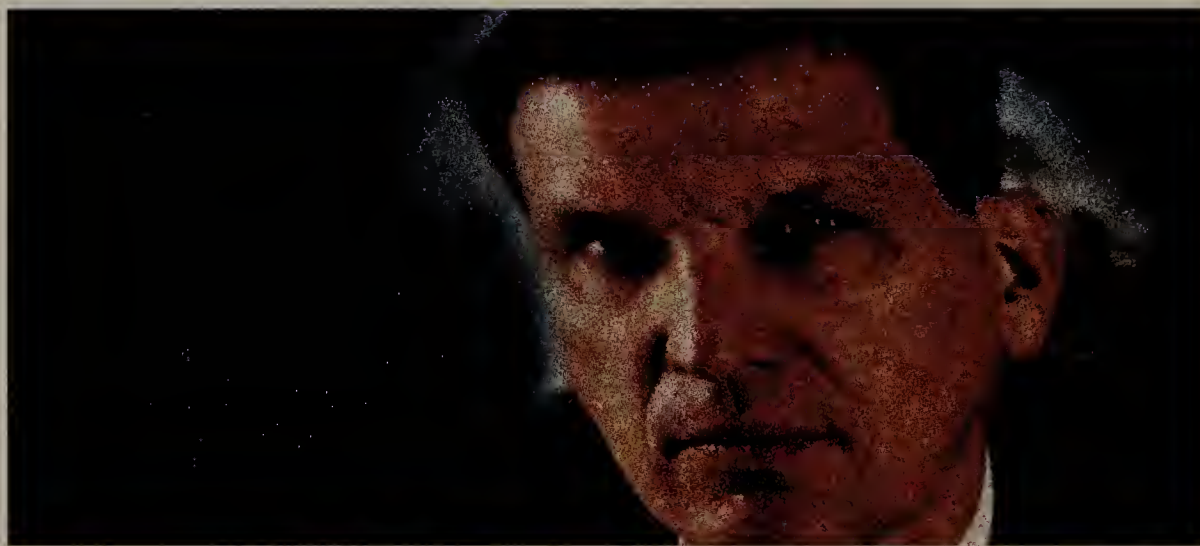
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THIS WEEK  
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### RESEARCH

#### Spider Bytes: The Web's best tools and tips

To celebrate the launch of The Edge, our new magazine section and site ([www.nwfusion.com/edge/](http://www.nwfusion.com/edge/)), we offer you this expanded set of Web goodies on optical networking (**DocFinder: 8426**):

- Brush up on optical networking with a tutorial from the WebProForum.
- What's the All-Optical Networking Consortium? This joint effort by AT&T Labs, MIT and Digital gives you a glimpse into the early days of optical networking.
- Find out how the military is using optical networking with an ATM twist.
- What are passive optical networks? Learn how they're bringing broadband to the local loop.

#### Newsletters

From the "Frame Relay" newsletter, **DocFinder: 8427**

"There is a key difference between the frame relay and ATM headers. Frame relay has two explicit congestion notification bits: the FECN and the BECN bits. But ATM has no BECN bit, so there's no place to put frame relay BECN information in ATM cells."

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### FORUMS

"We use a whole slew of operating systems. NetWare and Unix [have their] place for sure, but the average user would fall down with convulsions and froth at the mouth were we to install NetWare, Unix or any non-Microsoft software on their workstations. Microsoft apps work best with Microsoft servers. Period."

— from "Unix is King" forum. **DocFinder: 8428**

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### BARNEY'S RUBBLE

The best of the NetFlash daily newsletter



#### Flaw found in Pretty Good Privacy 5.0

Pretty Good Privacy lived up to its name as researchers discovered a flaw in older versions that could expose cryptographic keys. It's a good thing the specification's inventors turned down their original choice for a name. Amazingly Great Privacy just doesn't seem to fit. **DocFinder: 8434**

#### New York launches online sex offender registry

Andy Warhol once said everyone would be famous for 15 minutes. But if you're a sex offender living in New York state, you'll be well-known for a lot longer than that. Your face and address will be plastered all over the Internet. **DocFinder: 8435**

#### MSN browser requires a commitment

Do you love Microsoft and everything it does? If so, The Microsoft Network (MSN) is a dream come true. First, in order to use the updated client, you have to sign up for Microsoft HotMail. Then you download Microsoft's Internet Explorer. Once inside, you'll see links to Microsoft Messenger (instant messaging), Windows Media Player and Microsoft Money Central. Need a car? Microsoft's CarPoint is right at your service. Want a little unbiased news? MSNBC is at the ready. I doubt if this is Judge Thomas Penfield Jackson's favorite online service. **DocFinder: 8436**

#### IBM laying off around 1,000 U.S. services staff

Big companies can be so bizarre. IBM announced it is laying off 1,000 people in its services division, while at the same time the company wants to hire 15,000 to 20,000 folks for the same division. What a way to crush an ego. **DocFinder: 8437**

— Doug Barney, executive editor, news

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### COLUMNISTS



#### View from The Edge

Beware of service provider camouflage

Service providers often want to mask their choice of ATM, frame relay, pure IP or Ethernet-based carrier-edge devices behind the generic term "bundled services." But what they choose and how well they interoperate will be critical to their success. **DocFinder: 8429**

#### Compendium

Stuff you need to know

Want a snazzy presentation or a jazzed-up trade-show demonstration? Hire Newt Gingrich. Also find out what Elián's favorite NIC is. **DocFinder: 8430**

#### Help Desk

Ordering DSL

**Problem:** A reader wants to connect several warehouses around the country to the corporate network using DSL. **DocFinder: 8431**



## NEWS BRIEFS, JUNE 5, 2000

### Lucent grabs optical start-up

Lucent last week ponied up \$4.5 billion worth of its shares to purchase Chromatis Networks, a start-up provider of metropolitan-area optical networking switches. Lucent already has optical switching systems for carrier trunking between local and long-distance central offices. But it needed a family of optical switches that service providers could place at customer locations to multiplex voice, data and video streams onto high-speed local fiber. Chromatis' products, which are just hitting the market, feature technology called selective wave division multiplexing (SWDM), which lets service providers turn on additional optical wavelengths only when and where needed. Lucent officials say they chose Chromatis over several other start-ups because its SWDM and other money-saving features are attractive to new service providers with limited capital that hope to bring broadband services to the enterprise network market.

### State law targets virus makers

Pennsylvania lawmakers apparently have had their fill of computer viruses. Gov. Tom Ridge recently signed into law a bill that calls for prison terms of up to seven years and a \$15,000 fine for those convicted of intentionally spreading a computer virus. In addition, those convicted will also be required to pay restitution. The bill was written last year at about the time the Melissa virus was causing problems, but the measure's sponsors say it wasn't a direct response to that episode. The law is scheduled to take effect next month.



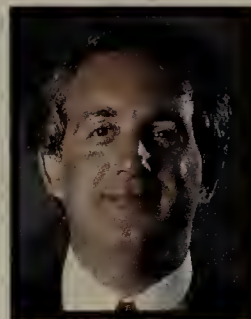
### Trade negotiators find "safe harbor"

The European privacy laws of 1998 that put stringent requirements on protection of personal data have been a bone of contention between the U.S. and Europe, threatening to disrupt trade relations as Europe demanded that the U.S. adopt equivalent privacy laws for data. Last week, however, the European Commission took a major step toward easing the tension by voting to approve the "safe harbor agreement" negotiated by U.S. and European officials more than a year ago. That agreement would give U.S. multinational firms a voluntary set of guidelines on how to manage data about European citizens stored in databases here. The European Parliament is expected to vote later this month on the safe-harbor agreement.

### Kapor lauds "retreat" from "euphoria"

The early hype surrounding the Internet and dot-com mania is giving way to a more

moderate view that ultimately will be a change for the better, according to Mitch Kapor, who founded Lotus and the nonprofit Electronic Frontier Foundation. "I think we're at a particularly important moment now in the evolution of the Internet," Kapor said during the opening keynote speech at the biannual Harvard Internet & Society conference last week. The "retreat from a kind of giddy euphoria" is occurring as a consequence of the recent correction on the technology-heavy Nasdaq stock market, Kapor said. One effect has been that the free flow of funding for start-up technology-related companies has slowed. But Kapor thinks the current state of affairs is an improvement on the 'Net's heady past because businesses that have actual business models and can "make money rather than just chase dreams" will now be the ones that obtain funding from venture capitalists.



**Mitch Kapor: Reality has overtaken some of the hype surrounding the 'Net.**

### A win for Transmeta, Linux

Fledgling processor maker Transmeta said last week that Gateway 2000 will use its Crusoe chips and Mobile Linux operating system in Internet appliances the company is developing with AOL. Gateway and AOL will put Crusoe processors and Mobile Linux in two appliances that are designed to give customers convenient access to the Internet. The first is expected to ship before the holiday shopping season, with the other following early next year. The appliances are expected to cost less than \$500.

### IBM forms e-comm alliance

IBM last week linked up with eight Internet services companies to create a global, mobile e-commerce alliance designed to help businesses develop wireless content and services for mobile phones, personal digital assistants and Internet appliances. The eight vendors are Agency.com, answerthink, Luminant Worldwide, Organic, Rare Medium, Razorfish, R/GA Interactive and US Interactive.

In exchange for support from IBM, the companies will create a percentage of their wireless Web software and services on IBM middleware. The percentage was not specified in a written statement from IBM. The companies will also conduct training, joint marketing and business development programs. The initiative is part of IBM's ongoing effort to work with other vendors that agree to use IBM technology.

# Java poised to take on greater mobile apps role

*Java 2 Micro Edition to be on display at JavaOne.*

BY JOHN COX

**SAN FRANCISCO** — At this week's JavaOne show, Sun will attempt to focus the attention of some 40,000 programmers on the latest technologies for building Java-based applications that run on mobile devices.

Sun and other firms see Java as the ideal technology for building a new breed of Web-based business applications that can be extended to users of personal digital assistants (PDA), handheld computers and cell phones.

### Java jives

The reason is simple. "Because of all the different sizes and shapes of these devices and the different operating systems, the quickest way to deploy business applications on them is to write them in Java," says Larry Roshfeld, a senior vice president at Aether Systems, a wireless integrator in Owings Mills, Md. "Java makes even more sense in a highly fragmented market than in a homogenous market."

Despite unstable early code, limited network connectivity and other shortcom-

ings in Java, some of the earliest programmers working with a new version of Java for handheld devices — Java 2 Micro Edition (J2ME) — remain enthusiastic.



"What Java brings to the table for users is interesting network applications [on handheld devices]," says Frank Greco, CEO of CrossRoads Technologies, a New York development company. "For developers, it brings many, many potential customers."

Motorola is among the device makers hoping to exploit Java's capabilities. At JavaOne, one company's semiconductor business will demonstrate a Java version of the company's iDEN handset, which is dubbed Condor and is slated for availability later this year. What Motorola wanted for the phone was applications.

"Java will bring to the wireless handset an enormous amount of flexibility because of its programmability," says Anne Marie Larkin, a vice president with Motorola's wireless software group. By mid-2001, Motorola plans to be shipping a line of Java-based personal cellular devices for games and other interactive entertainment applications.

Because there are so many types of handheld devices, hardware manufacturers and software developers have been pressuring Sun to create a Java structure that's flexible and adaptable.

J2ME is designed now as core code, on top of which are added specialized features and APIs. J2ME has at least two virtual machines, the more complete one for somewhat larger devices such as Nokia's Communicator line of handsets, which blend a cell phone and a computer. The second vir-

See **Java**, page 122



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For the answer to this week's question and more net trivia, visit **Network World Fusion** and enter **2349** in the Search box.

### This week's question:

What company topped the most recent Network World 200, which ranked the leading network industry companies based on 1999 revenue?

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# Akamai rolls out traffic management services

BY DENISE PAPPALARDO

CAMBRIDGE, MASS. — Akamai is launching a service this week that will let business users better manage their global Web site content.

FirstPoint, Akamai's global traffic management service, is designed for businesses that have multiple Web servers on the Internet. The service is designed to route end-user requests over the 'Net to the least busy server hosting the desired content.

The service differs from content distribution packages such as Akamai's flagship FreeFlow offering. FreeFlow caches Web site content on servers at the edge of the Internet and directs

service last month called Global Traffic Management. Speedera's service also automatically routes end users to the closest, best performing content server.

However, one of the biggest differences between Speedera's service and Akamai's is the price. Speedera's service is \$3,500 per site per month. Akamai's

service is \$5,500 per site per month.

The reason for the difference in price could be related to size: Speedera's network comprises 30 locations today (with 100 planned for year-end), while Akamai's network is already collocated with more than 160 ISPs.

Akamai: [www.akamai.com](http://www.akamai.com)

## Akamai offers traffic management

Akamai's latest service, FirstPoint, includes features such as:

- Proactive measurement and mapping of Internet and Web server performance, including packet loss and latency.
- Automatic detection of the most optimal Web site for each end-user request.
- Ability to recognize congested Web servers and reroute traffic accordingly.
- Fully managed, 24-7 service.

users to the geographically closest cache servers. FirstPoint uses proprietary software algorithms to determine which server will offer end users the fastest access to cached material.

Akamai has deployed "agents" throughout its network that look for outages, congestion and latency, says Amy Swotinsky, product manager at Akamai. After Akamai's FirstPoint system analyzes the data the agents have collected, the system creates network maps that are used to direct each request for content to the most optimal server, Swotinsky says. These network maps can be updated every 10 seconds.

Ticketmaster Online-CitySearch has been testing Akamai's FirstPoint service for about two months and has noted performance improvements and faster download times, says Sean Moriarty, vice president of Internet systems at the company. "We plan to integrate the service across all of the Web sites, but we will still be exercising due diligence as far as continued testing because the service is so new. But we are very impressed with the results so far," Moriarty says.

FirstPoint does have competition. Speedera Networks launched a similar

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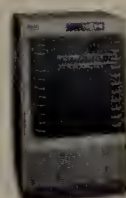
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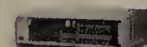
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# New gear paves way for converged services

BY TIM GREENE

ATLANTA — SuperComm 2000 this week will feature new gear to enable streamlined packages of network services for enterprise customers.

Key among the new equipment are switches that handle voice and data, making it less expensive and faster for service providers to provision new services. Customers of such providers wind up with more flexible voice, video, data and Internet services that they can buy from a single carrier.

Newcomers Oresis Communications and Telica as well as

veteran player General DataComm (GDC) will wheel out switches that will let upstart carriers jump into local markets and give established local carriers tools to migrate to cheaper, more efficient nets.

Telica will announce a plan to package its multiservice switches with Redback Networks' gear, which manages the services customers buy from service providers. That combination will enable voice and data services to be delivered over a single line, and traffic to be sorted at the edge of the carrier network and switched into carrier voice or data backbones.

## SUPERCOMM 2000

Oresis will unveil its first product, the Isis-700 Integrated OmniService switch, which the company says will cut carrier edge-switch costs in half and cut provisioning times for new services to hours rather than weeks. Oresis will then demonstrate the Isis-700 simultaneously handling voice and video circuits, as well as frame relay, ATM and IP traffic.

GDC will announce it's teaming with Taqua Systems to enable voice, video and data

switching using GDC's NexEra packet voice and data gateways to take packet traffic and translate it into traditional voice traffic. Then Taqua's Open Compact Exchange local access switch would route voice traffic toward traditional voice networks.

Tellabs also will introduce a new line of switches that can handle local traffic or trunking between carrier offices.

Carrier Broadwing will introduce local voice services that it will support using switches located hundreds of miles from the customer. Customers will

**More on the show, page 124.**

be able to buy bundles of local and long-distance voice services as well as data and Internet access. Rather than installing local phone switches in each city where it offers service, the carrier will use a switch extension that draws some of its features from a complete local switch in Cincinnati, the company says. That architecture saves money.

Also making a move on local services networks is net.com, previously N.E.T., to go with its new mission: building service-creation equipment for broadband networks. The company's gear will let carriers add content such as network-based applications to broadband access services. It will introduce its first new product since its name change. That device, *Scream200*, is a hardware platform to support voice over DSL. ■

# Microsoft not budging on antitrust case

BY JAMES NICCOLAI

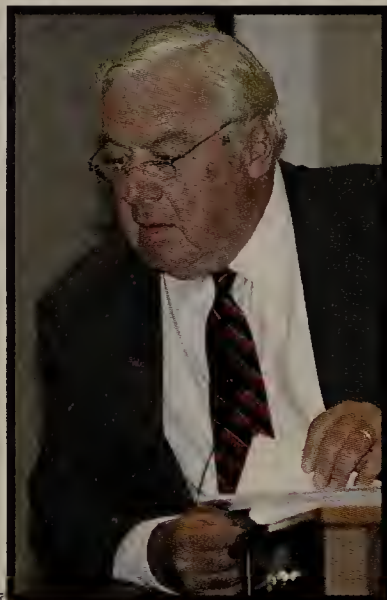
Microsoft last Wednesday issued what the company thought would be its final response to the U.S. government's proposal to split the software titan into two separate companies, paving the way for District Court Judge Thomas Penfield Jackson to issue a final ruling in the case at any time.

But last Thursday, Jackson gave the U.S. Department of Justice and the states that have sued Microsoft for antitrust violations until today to file additional comments on Microsoft's latest brief.

Jackson said Microsoft would then have until June 7 to file a response to the government's comments.

In its court filing last week, Microsoft repeated its criticism that the government's proposal to break up the company is extreme and out of proportion to the judge's findings. The software vendor offered a detailed critique of the government's proposal, in which it addresses for the first time the logistical and economic realities that such a move would entail.

Highlighting the complexities of dividing a giant, global corporation that has subsidiaries in 75 countries, Microsoft asked Judge Jackson to grant it one year to submit a detailed proposal of the steps the company would take to



**Judge Jackson: Decides government should take closer look at Microsoft response.**

divide itself in two. The Justice Department's proposal submitted last week allowed four months for Microsoft to pull such a plan together.

The company criticized what it referred to as a "glaring omission" in the Justice Department's breakup proposal — its failure to provide a clear definition of what constitutes an "Internet browser." The definition is crucial, Microsoft argued, because the government has asked the court to limit how the operating systems side of Microsoft's business can develop the product.

The filing also addressed government criticisms of Microsoft's last-minute "offer of

proof" submitted last week, in which it listed evidence and witnesses (such as Compaq CEO Michael Capellas) that Microsoft would have presented had it been given more time to argue against the breakup.

The Justice Department last week called the submission "a cynical ploy calculated to raise diversionary issues on appeal," and criticized Microsoft for not submitting it earlier. Microsoft said the offer of proof had been prepared for use only if Judge Jackson chose to terminate the remedies phase of the trial without further hearings. No appropriate occasion had arisen earlier to submit the filing, the company added.

Jackson, in his final ruling, is anticipated to side with the government's request that Microsoft be broken up. Microsoft has vowed to appeal the decision, a process that could delay any structural changes for months or even years. The government has recommended that certain behavioral restrictions be applied in the meantime.

*Niccolai is a senior editor with IDG News Service in San Francisco.*

**More on Microsoft and its legal issues with Sun. Page 54.**

# Device stretches Gig Ethernet

BY PHIL HOCHMUTH

BOTHELL, WASH. — Allied Telesyn this week will announce a device that can stretch the range of Gigabit Ethernet connections over multimode fiber up to 2 kilometers.

The new stand-alone, modem-sized device, the AT-EX1001SC/GM1 Gigabit Ethernet extender, could be helpful to enterprise network architects who have balked at the use of Gigabit Ethernet for long-distance networking — such as linking branch-office LANs together, or as a WAN communications technology.

In the past, users have had to replace multimode fiber-optic cables with more costly single-mode fiber to use Gigabit Ethernet as a long-haul medium.

The AT-EX1001SC/GM1 can be used to connect two Gigabit Ethernet devices over multimode fiber at a distance of up to 2 kilometers — four times the 500-meter limit of standard IEEE 802.3z Gigabit Ethernet over multimode fiber.

The device requires no management software and can plug in to standard Gigabit Ethernet switches, routers or network interface cards.

"Customers, such as banks

or insurance companies, who've deployed FDDI may want to deploy Gigabit Ethernet, but they don't want to rip out all their multimode fiber to do so," says James Mustarde, director of marketing for Allied Telesyn.

By letting customers keep their existing wiring infrastructures, Mustarde says Allied Telesyn's product provides "an almost transparent transition to Gigabit Ethernet."

Devices that can extend Gigabit Ethernet range will become more valuable to users as Gigabit Ethernet becomes more commonly employed to connect LANs together over long distances and even as a WAN platform.

Worldwide shipments of Gigabit Ethernet switch ports were up more than 500% last year, according to IDC, in Framingham Mass.

The AT-EX1001SC/GM1 Gigabit Ethernet extender will be available later this month. It will sell for \$3,000.

Allied Telesyn: [www.alliedtelesyn.com](http://www.alliedtelesyn.com)

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# FCC order won't reduce business telecom surcharges

*In fact, businesses might even see a new surcharge added to their bills.*

BY DAVID ROHDE

WASHINGTON, D.C. — Don't look for any of the annoying surcharges on your company's telephone bill to go away anytime soon, despite a widely publicized order by the Federal Communications Commission to reduce users' costs.

The FCC last week changed the system of collecting money to assure universal service by adopting a proposal from six large carriers to consolidate several current charges on residential users' phone bills into one slightly lower fee.

But business users — except those who happen to be at locations with only one phone

line, an increasing rarity in the Internet age — will see their current surcharges remain, and may even face a new one in coming months.

Under the FCC order, business users will continue to pay — as they have since AT&T's breakup in 1984 — a per-line fee called the Subscriber Line Charge (SLC). That fee has been creeping up during the years and now stands at a maximum of \$9 per month.

Business users will also continue to pay the Primary Interexchange Carrier Charge (PICC), a controversial charge that arose after the FCC expanded universal service coverage following the Telecom-

## Complexity continues to reign

**While monthly surcharges are being consolidated on residential telephone bills, multiline business locations will continue to see multiple surcharges:**

- **Primary Interexchange Carrier Charge (PICC):**  
\$4.31 per line\*
- **Subscriber Line Charge (SLC):**  
\$9 per line\*
- **Universal Service Surcharge:**  
To be determined by each carrier under a new FCC formula.

\*These are price caps; may be less in some areas.

SOURCE: FCC, WASHINGTON, D.C.

munications Act of 1996.

The PICC is technically a charge levied by local carriers

on whichever long-distance carrier a user selects as the pre-subscribed carrier for each

line. But in practice it is almost always passed along by the chosen long-distance carrier to the user as a billing line item. The PICC is the main charge the FCC is eliminating for residential users.

The agency said the PICC might be eliminated down the road for business users, too. But frustrated representatives of the business community accused the FCC of trying to hide the impact of its decision, especially after the agency unexpectedly released its order with a glowing announcement about omitting the business user charges, instead of scheduling a meeting for the usual public vote of the five commissioners.

"They put a wonderful spin on it," says James Blaszk, attorney for the ad hoc Telecommunications Users Committee, a group of about 20 large corporations. "You'd think they were in the political consulting business."

Blaszk noted that the FCC soft-pedaled another part of the order, which sets up a \$650 million fund designed to compensate mainly rural carriers with unusually high local-loop costs for keeping the new combined residential SLC and PICC down. The new money may be raised by increasing the current percentage "universal service surcharge" that many long-distance carriers levy on business users or may show up as yet another new line item, Blaszk says.

The FCC order did come with one bit of good news for business users. The agency set a schedule for continuing to reduce the per-minute toll that local carriers assess long-distance carriers for completing their calls. In the next four years, the rates will go down from the current average of less than 2 cents per minute to 0.55 cents per minute.

But business users will have to mention this new schedule in their carrier negotiations if they want to gain a corresponding reduction in their long-distance rates, Blaszk says. "The telecom market is not designed to protect the weak and uninformed," he says. ■

# Foundry enhances its load-balancing software

BY JIM DUFFY

SAN JOSE — Last week, Foundry Networks announced a new version of its content-switching software that is designed to let users build more secure and manageable server load-balancing environments.

Foundry's Internet IronWare 7.0 runs on the company's ServerIron line of Internet

traffic and content management switches. The software is designed to improve the function of these switches in enterprise, e-commerce and ISP sites.

Server load balancing and Web switching is an increasingly hot market thanks to the precision with which the switches can steer high volumes of 'Net traffic. Cisco recently bought Web switch maker ArrowPoint for \$6 billion, and several large vendors have partnered with F5 for load-balancing technology.

Analysts say Foundry's Internet IronWare 7.0 software enhances current security and management features of the ServerIron switches and fills gaps.

"There's a bunch of vendors in the market and none of them have a tendency to get three or six months ahead of anybody else in terms of features," says Mark Hoover, president of Acuitive, a market research and consulting firm. "At any point, you can point to a vendor and say, 'Here's

something that nobody else has, and here are some things that are missing that other people have.'"

Among the new features in the system's Internet IronWare 7.0 operating system is multi-zone firewall load balancing, which lets users deploy Web servers in previously unsecured areas. The software also features enhanced network address translation support, which is intended to preserve IP addresses and improve security for intranets and server farms.

Security has been an issue with ServerIrons. Earlier this year, Foundry issued a fix after a Bugtraq posting stated the firm's TCP/IP implementation made ServerIron switches susceptible to denial-of-service attacks. No users were affected by the glitch, Foundry says.

To help ensure that security never again becomes an issue, Foundry has added a feature called Secure Shell to Internet IronWare 7.0. Secure Shell access enables secure remote management of ServerIron switches, Foundry says.

Version 7.0 also has a feature called Slow Start that lets users add servers to the load-balancing pool online. The software also enhances the

"content awareness" of ServerIrons so they can perform detailed content health checks on Web servers, and switch Web traffic based on URLs and cookies at the same time.

Lastly, Internet IronWare 7.0 lets users configure preferential intranet server sites for different branch offices. This is a specific enhancement for companies performing server

load balancing on a global basis.

"Foundry is especially strong in what they call global load balancing," Acuitive's Hoover says. "The flexibility they give you in terms of deciding which subsets of the features to use and how they relate to one another is a little bit better" than competitive offerings.

Internet IronWare 7.0 is available free to all new and existing Foundry ServerIron customers.

Foundry: [www.foundrynet.com](http://www.foundrynet.com)

## You IronWare it well

### Features of Foundry's Internet IronWare 7.0:

- Multizone firewall load balancing for enhanced security.
- Enhanced Network Address Translation support.
- Secure Shell access, which enables secure remote management of ServerIron switches.
- Slow Start, which enables servers to be added to the load-balancing pool online.
- Enhanced ability to perform content health checks on Web servers, and to switch Web traffic based on URLs and cookies at the same time.
- Affinity-based site selection in global server load balancing, which lets enterprise users configure preferential intranet sites for different branch offices.

**Foundry CEO Bobby Johnson's take on the current router race. Page 23.**



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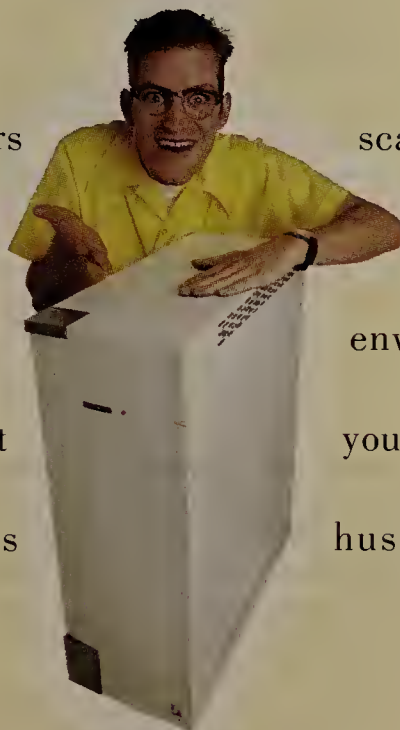
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champagne can be cost prohibitive, especially if you have untold throngs of servers. Fortunately, there is another tool to help you in the ongoing need to lead.

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# Big Blue makes mainframe Linux push

IBM offers software to help customers run databases, messaging systems on Linux-based mainframes.

BY MARC SONGINI

ARMONK, N.Y. — As expected, IBM has begun introducing software products that will let customers build and run Linux applications on mainframes.

Among the tools announced are software connectors that tie Linux applications to messaging and database applications on the S/390 mainframe (NW, March 4, page 1). The company also announced a Tivoli software client to manage the backup and storage of data needed for mainframe-based Linux applications.

By supporting traditional enterprise-class applications such as DB2 and Lotus Domino as Linux applications on mainframes, IBM is trying to increase the operating system's standing in the large-scale business community. Linux on mainframes gives the operating system an enterprise-class look and feel,

IBM says. Customers using the mainframe to run Linux applications can take advantage of the high reliability and security of the mainframe, as well as its fast I/O technology and capacity to support thousands of users.

## Why S/390 Linux?

- Users can run some 41,000 Linux virtual machines on a single mainframe.
- It opens up many new applications to the mainframe.
- Linux staff cost less than Big Iron staff.
- The S/390 Linux download from IBM is free.

For several months now, IBM has offered a free Linux download that will run on the S/390. It has drawn about 2,100 takers.

Linux has given mainframe aficionados the most fun

they've had in a decade, says Adam Thornton, a freelance consultant and the head of Princeton University's Linux on the mainframe project. Not only is it making the mainframe a hipper platform to work on, but there are bottom-line benefits, too.

Thornton says customers can save 75% of hardware costs by creating Linux virtual machines — essentially logical servers on a mainframe — instead of buying individual servers. Linux staff are also cheaper to hire than their mainframe counterparts.

The Enterprise Connectors for Linux for S/390 will serve as high-speed links from Linux applications to the S/390-based IBM DB2 database, MQSeries applications messaging and the CICS transaction monitor software. IBM claims users could, for example, link front-end Linux Web server software and DB2 programs, and run them on the same machine. The con-

nections would work at the mainframe's memory speed, IBM says.

IBM also announced a version of DB2 that will run natively on Linux on the S/390, as well as Linux/S/390 versions of the Tivoli management framework and the WebSphere Application Server.

A Linux Web server attached to a DB2 database running on OS/390, all within the same mainframe, could run high volumes of Internet transactions at mainframe speeds, Thornton says.

The Enterprise Connectors for Linux for S/390 and the DB2, Tivoli framework and WebSphere Linux software will be available in the fourth quarter.

The release date for the Tivoli Storage Manager Client for Linux for S/390 will be announced later this year.

Pricing for the middleware was not disclosed.

IBM: [www.ibm.com](http://www.ibm.com)

# TurboLinux to announce layoffs, new CEO

Linux operating system remains hot in Internet marketplace despite some market turbulence.

BY APRIL JACOBS

TurboLinux last week joined other Linux vendors toughing out turbulent market times, announcing layoffs and a new CEO.

The layoffs were reportedly an effort to cut costs and help the company increase profits. The layoffs did not have a bearing on the company's decision to install Paul Thomas, who has served as chief operating officer, in the CEO seat.

The company has moved former CEO Cliff Miller into the role of chairman, a move that reportedly has been discussed for some weeks.

TurboLinux, known for its Linux clustering software, first made its mark in the Asian market, which was ripe for a low-cost open source

operating system, according to observers. But mixed marketing in the U.S. — pushing into the consumer market while simultaneously focusing its technology development on the higher-end Linux server clustering — may have resulted in customer confusion.

John Dunkle, an analyst with Workgroup Strategic Services in Portsmouth, N.H., says the company needs to clear up its strategic direction. "There is inconsistency, which is not a good sign," he says.

## Still going strong

But despite the rough seas Linux companies have been weathering lately, including a recently pulled initial public offering and layoffs at LinuxCare, the operating sys-



tem continues to garner market share — particularly in the Internet space.

Larry Augustin, president and CEO of VA Linux Systems, told attendees at the European Linux Conference in London last week that 60% of Web servers on the Internet are running Apache, the open source Web server software.

"In 1998, Linux had 16% of the server operating system market. And in 1999, it already had 25%," he said, citing figures by IDC, a mar-

ket research firm in Framingham, Mass.

But he also acknowledged that the main barriers keeping Linux from crossing over to mainstream acceptance by companies are not easy to overcome.

The "open" model of Linux — which is widely considered to be its strength — can also hinder its acceptance in some cases, Augustin added. "People don't like the fact that the code is constantly being developed," he said. "They don't like the fact that there are three kernel releases [per] week on the Internet," he added, referring to the heart of Linux source code, which is constantly under construction.

*The IDG News Service contributed to this story.*

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# SAN vendors joust over future of Fibre Channel

BY DENI CONNOR

SAN JOSE — "Fibre Channel is dead." That was the controversial conclusion of one participant in a heated debate about storage-area networks over Gigabit Ethernet held at the SAN 2000 conference here last week.

Network infrastructure and storage vendors 3Com, Hewlett-Packard, Adaptec, Qlogic, Gadzoox Networks, SAN, Ltd., Network Appliance, Agilent Technologies and Genroco argued over new proposals to carry storage data over 10-Gigabit Ethernet, and what some see as a sooner-rather-than-later demise of Fibre

Channel technology.

Four proposals touting storage over IP are currently being submitted to the Internet Engineering Task Force (IETF) for consideration as standards. Included are three that want to send block-mode storage data over 10-Gigabit Ethernet.

There's the SCSI over TCP/IP proposal from IBM and Cisco, which is supported by HP.

There's also a draft specifica-

tion from Adaptec that calls for a new transport protocol, EtherStorage, in which storage travels over existing Ethernet technology.

And there's SAN, Ltd.'s proposal, the Service Specific Connection Oriented Protocol (SSCOP), to route storage data over IP using an International Telecommunication Union protocol that allows data to be retransmitted selectively if problems occur. SSCOP is a data link protocol used in ATM.

The fourth proposal suggests using IP as a more immediate fix for routing data between geographically separated SANs. It includes work from Gadzoox and Lucent that proposes stick-

ing a metropolitan-area network (MAN) between SANs and routing data between them with devices such as Cisco's Metro 1500 dense wave division multiplexer.

While participants agreed that one specification would eventually prevail and become a standard in an IETF working group, tempers flared as vendors debated the merit of each technology. The panel, a mix of Fibre Channel manufacturers and 10-Gigabit Ethernet proponents, agreed in large part that users are feeling pain implementing Fibre Channel.

"People are very Ethernet-centric in the midsize enterprise, where Ethernet is perva-

## Pending IETF storage-over-IP proposals

**Four proposals are being submitted to the IETF for sending storage over Gigabit Ethernet networks.**

IBM/Cisco

- SCSI over TCP/IP

Gadzoox/Lucent

- Fibre Channel tunneling through IP

Adaptec

- EtherStorage

SAN, Ltd.

- Storage over IP with selective retransmission

## Storage

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# Veritas bolsters SAN management software

BY DENI CONNOR

Storage administrators will have an easier time managing their resources and Fibre Channel hardware with software Veritas introduced last week, the company claims.

Dubbed SANPoint Control, the software lets managers allocate storage space to particular servers, monitor hardware devices on the Fibre Channel storage-area network (SAN) and manage user access to storage.

Veritas' SANPoint Control 1.0 will discover storage devices, map their topology and position in the SAN, and identify their status and characteristics. The software will identify the physical and logical relationships between devices so a storage administrator can manage them more easily. Among the devices SANPoint Control will monitor are disk arrays, JBODs (Just a Bunch of Disks), tape libraries, host computers and Fibre Channel hubs, routers, switches and host bus adapters.

With the market for storage equipment exploding, analysts say the cost of managing the equipment is seven to eight times the cost of the storage itself.

"Storage management software has four parts: data protection, data placement, storage administration and storage resource management. If you

are going to manage the SAN you are going to need all this software," says David Hill, an analyst with Aberdeen Group in Boston. "And you want a company to provide it that is hardware neutral and will manage all types of servers and storage devices. Veritas is that company — they are on the right wavelength."

Rich Walters, a technical specialist with utility company Southern California Edison in San Onofre, has Solaris, Sequent, Windows NT, NetWare and Hitachi servers, as well as Compaq StorageWorks storage and Brocade switches configured in a SAN. "They all use the SAN and will be pretty useful when we can do volume management from a single console with this software," he says.

SANPoint Control operates with Solaris servers connected to any type of storage device or array. Veritas has completed interoperability tests with a number of servers and Fibre Channel devices including EMC Symmetrix arrays, Hewlett-Packard NetServer and N Class

servers, StorageTek tape libraries, a variety of host bus adapters from Emulex and JNI, Crossroads' routers, and Brocade, Vixel and Gadzoox Networks switches.

The software conforms to several standards specifications including Sun's Jiro, the Storage Networking Industry Association Common Information Manager Object Manager and the Fibre Channel Alliance

Management Information Base. Subsequent versions of the software expected to be released in the fourth quarter of this year and the first part of 2001 will extend capability to NT and Win 2000 as well as HP-UX and AIX servers. These upgrades will include the ability to automatically set policies for the operation of the SAN, enforce thresholds and perform root-cause analysis of detected problems.

SANPoint Control 1.0, available in the third quarter, starts at about \$50,000 for a Sun Solaris 5000 server configuration. ■

sive," says Mark Lohmeyer, marketing and business development manager for Adaptec. They are not familiar with Fibre Channel installation and interoperability, and have hesitated to adopt it, he adds.

"Fibre Channel is not very good for long distances," adds Wayne Rickard, chief technology officer at Gadzoox, noting the technology's latency, dropped packets and congestion problems. IP-based MANs are a perfect device for joining SANs over distance, Gadzoox says.

Like many of the debate participants, 3Com system architect Dave Lee believes Fibre Channel will not disappear overnight but that its use will wane over the next two years. "The pending drafts [for storage over IP] are not perfect solutions, but they will come to fruition," he says.

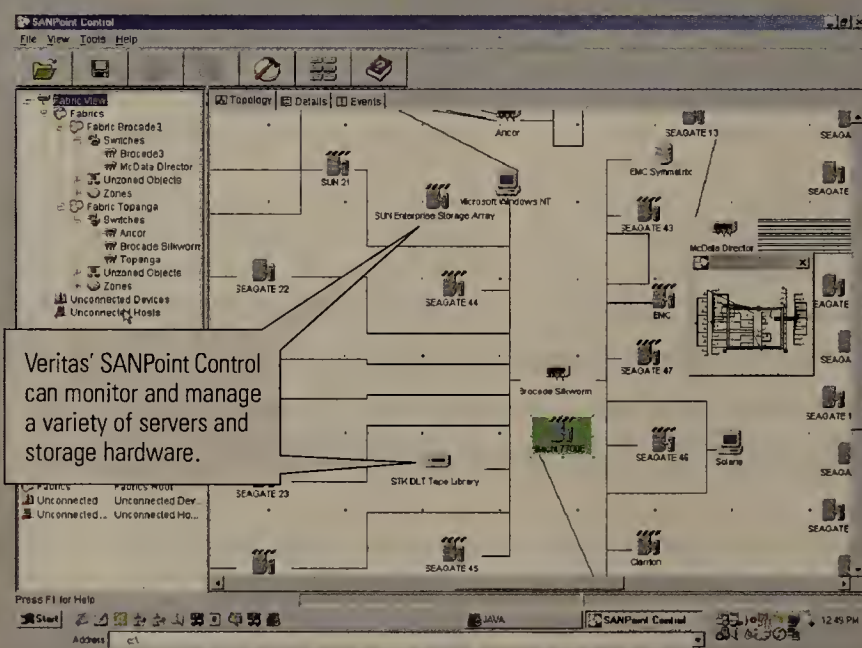
Nigel Squibb, technical director for SAN, Ltd. in the U.K., says his company is firmly committed to 10-Gigabit Ethernet. "Remember FDDI? Fibre Channel is just FDDI on steroids," he says. "We are deluding each other if we think anything other than storage over IP will work. Cisco says use IP, and look at what they did to FDDI — they are capable of doing the same to Fibre Channel."

Vendors such as SAN, Ltd., Gadzoox and Adaptec are going ahead with work on storage-over-IP products before a standard is adopted. They say that however those implementations work, they will be software-upgradable when a standard appears.

By year-end, the IETF will have a working demonstration of a storage-over-IP standard. ■

## Veritas' SANPoint Control

**The software discovers and maps the Fibre Channel and SCSI storage network and lets a storage administrator assign servers to storage, allocate storage to different servers and monitor the operation of Fibre Channel devices on the network.**





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# Nortel bolsters portable IP routing package

BY JIM DUFFY

**SANTA CLARA** — Nortel Networks last week announced a new version of its portable routing code that lets users add network service applications to the software framework.

Nortel's Open IP Environment 2.0 is intended to enhance interoperability among a range of hardware and integrate with a broader array of computer platforms and devices. It does this by unbundling some of the software components — such as routing protocols — and leaving its APIs exposed so users can add features to the framework.

The Open IP Environment framework is comprised of four API sets that let users integrate the software with IP applications, policy and management services, platform hardware and operating system software.

Previous versions of Open IP Environment bundled some of the IP applications, or components, with the

framework. This increased the time it took developers to bring Open IP products to market because they would have to “unplug” the components they didn't need, says Kalai Kalaichelvan, Nortel's Open IP general manager. Open IP 2.0 inverts that requirement and reduces time-to-market by letting users add components they need rather than subtract those they don't, he says.

Among the unbundled components are the Open Shortest Path First, Routing Information Protocol Version 2 and Border Gateway Protocol-4 routing protocols, and the IP 4 network protocol. Version 2.0 also offers the SNMP and Nortel's command-line interface for router configuration as plug-in components.

Analysts say Version 2.0 may broaden the market for the Open IP Environment.

“It expands further how Open IP can be applied within different net-

## Open, says IP

### Features of Nortel's Open IP 2.0

- APIs for linking underlying operating systems and processors, and adding OSPF, RIP Version 2, BGP-4 and IPv4 modules.
- Support for SNMP.
- Support for Nortel's command-line interface.

work environments,” says Ron Westfall, an analyst at Current Analysis in Sterling, Va. “It allows licensees a little more flexibility in terms of how they use the routing code, and to be a little more innovative.”

Westfall does not expect Cisco to follow suit with its own portable code, but believes it must eventually open its IOS routing software.

“Cisco understands that IOS would

be more beneficially used within an open framework, much like their mantra regarding open telephony,” Westfall says. “The same principle applies to routing code as well. That's a benefit to the whole industry, including Cisco because it will allow them to sell different products within different markets with a great deal more flexibility than they could do today.”

Open IP Environment is designed to Internet-enable a range of devices, from servers and network processors to set-top boxes, mobility devices, personal digital assistants and PCs. The software lets users add routing, authentication, security, encapsulation, tunneling, quality of service, policy management, network management and accounting to these devices.

Nortel has issued more than 200 Open IP Environment licenses to more than 100 customers, most recently Samsung's Internet Network Division. ■





# Analysts: Merger is mixed blessing for Baan users

BY CLARE HANEY

Last week's news that ailing enterprise resource planning (ERP) software vendor Baan will finally be acquired should come as a relief to users of the company's applications.

Being acquired by U.K. automation and controls firm Invensys for more than \$700 million will return Baan to its roots as a maker of manufacturing software, so users of the vendor's discrete manufacturing applications are sitting pretty, according to analysts.

"Invensys has a very strong manufacturing focus," says Dennis Byron, director of enterprise application research at IDC in Framingham, Mass. It's much better for Baan and its users that the vendor will be acquired by a company with manufacturing expertise than by a more predatory firm only interested in milking Baan's revenue stream, he adds.

But analysts caution that it's not a

## A new team

Profiles of Invensys and its planned acquisition, Baan.

### INVENSYS

<b>Headquarters:</b>	London
<b>Product:</b>	A wide array of industrial, engineering and Internet technology products.
<b>CEO:</b>	Allen Yurko
<b>1999 financials:</b>	Revenue: \$634 million; Profit: -\$289 million
<b>Employees:</b>	130,626
<b>Web site:</b>	www.invensys.com

time for champagne all round, because they expect Invensys to spin off some Baan operations that the manufacturing company perceives to be noncore.

Additionally, Baan's won't be the only manufacturing software at Invensys.

### BAAN

<b>Headquarters:</b>	Barneveld, The Netherlands
<b>Product:</b>	Enterprise resource planning software
<b>CEO:</b>	Pierre Everaert (interim)
<b>1999 financials:</b>	Revenue: \$15 billion; Profit: -\$169 million
<b>Employees:</b>	4,700
<b>Web site:</b>	www.baan.com

The company last year acquired ERP vendor Marcam Solutions and in 1998 purchased manufacturing software specialist Wonderware. "It's quite a technology mishmash. It's an area that needs integration and to pull it together will be quite a challenge," Byron says.

One way Baan may be able to assist in that integration is with its middleware, which Byron dubs the company's "hidden jewel."

If users are happy with Baan's core applications, they should stay put, analysts advise, because ERP software, once deployed, will typically serve well for between three and seven years.

However, Bruce Bond, a vice president at Gartner Group in Stamford, Conn., believes that users of Baan's process manufacturing applications should probably start looking for a migration strategy.

Any customers at a very early stage of implementing the ERP vendor's software or having trouble with deployment should also investigate if they can move away from Baan applications, he adds.

*Haney is bureau chief for IDG News Service in San Francisco.*



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## Firewalls, continued from page 1

They're known as distributed firewalls, and they're the next line of defense against hackers who breach traditional firewalls guarding the edge of corporate networks by exploiting open firewall ports as well as e-mail servers.

Distributed firewalls, still in their infancy in terms of reporting, configuration and management capabilities, are gaining more attention. However, there's much debate among security vendors and analysts on their intrinsic value.

### Added firepower

Network managers tend to see distributed firewalls as added firepower against an implacable foe, the hacker.

"It's a dual protection," says Rick Shantery, senior network engineer at Intellinetics, a document management firm in Columbus, Ohio. He added CyberWallPlus embedded firewall software, a product from Network-1 Security Solutions, to his internal servers after he reached the painful conclusion that hackers occasionally made it though the WebRamp Internet access and firewall box Intellinetics uses.

"I could see from the log data they were coming in," he says. "These deliberate hack attacks happen daily, along with SYN floods. If they make it through, the embedded fire-

wall in the server is there to stop them. You don't really have to have the perimeter firewall."

However, many would argue that point.

"The perimeter firewall is a necessity," says Raphael Reich, product marketing manager at Check Point Software, which has augmented its Network-1 perimeter firewall line with two types of distributed firewall software. The first is Secure Server software, which is a distributed firewall for Windows NT or Unix; the second is Secure Client, a desktop firewall.

"The perimeter firewall doesn't protect you from the bad guys inside the network," Reich says. "But people should not be replacing perimeter firewalls with distributed ones."

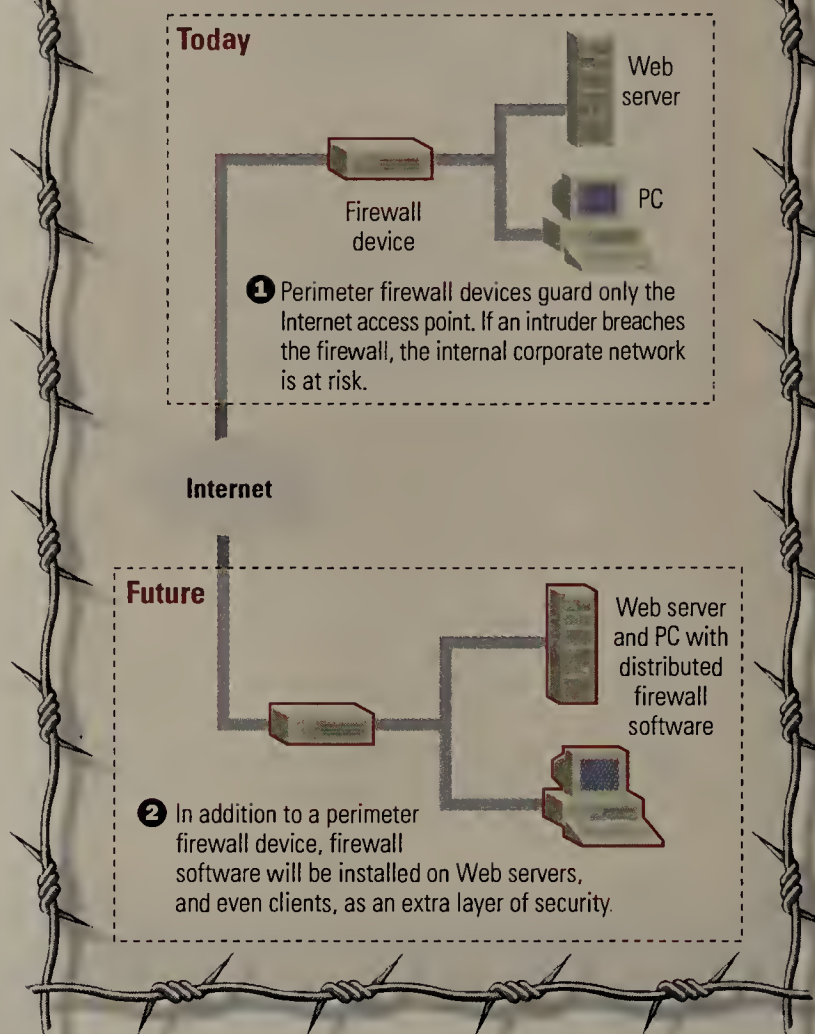
Drawbacks to the conventional firewall have been given greater scrutiny of late by some of the top firewall experts.

In the paper "Distributed Firewalls," Steven Bellovin, an AT&T Labs researcher and author of the classic "Firewalls and Internet Security," casts a critical eye on the traditional DMZ-style firewall guarding the Internet zone. He calls such firewalls network choke-points that do little to stop inside attacks.

"On the other hand, distributed firewalls can reduce the threat of actual attacks by insiders, simply by making it

## Firewalls for everyone

Developments in distributed firewall technology could make networks more secure in the future.



wall on it."

In addition, having the firewall on the server rather than in front of the box might make it harder to filter attacks.

John Pescatore, research director for network security at the Gartner Group consultancy, concurs.

"The problem is the Webmasters control the Web server," Pescatore says, noting that when they make wholesale changes, it could destroy the efficacy of the firewall software on it. "There's no chance firewall software will survive on the server. Web server firewalls won't be widely used."

Pescatore is bullish on the idea of embedding firewalls in silicon, something that Secure Computing is undertaking with 3Com in the Typhoon network processor and WatchGuard is trying to do by licensing its Firechip silicon for modems. Hardware will support faster packet processing than software, he says.

Expressing a view shared by many others, Pescatore doesn't advise ditching the perimeter firewall for host-based firewalls.

Framingham, Mass., market research firm IDC says approximately \$1 billion worth of firewall gear was sold worldwide last year. The organization notes that demand for personal firewalls will increase as more corporations adopt DSL and cable modem connections for branch offices and telecommuters.

With these high-speed services always "on," end users' computers are more vulnerable to port scans and attacks. But some observers believe hardware-based firewall appliances, perhaps embedded in modems, may trump host-based software firewalls because they can be better managed at present and provide better protection.

There's one point nobody seems to debate: Corporations will likely spend more money to fortify their networks with the new generation of distributed firewalls.

"It does cost more money than just having a perimeter firewall," Intellinetics' Shantery says. ▣

## Firewall market looms large

As enterprise network security concerns increase, so will the market for firewall software of all kinds, analysts say.

U.S. firewall revenue  
(in millions)



SOURCE: IDC, FRAMINGHAM, MASS.

easier to set up smaller groups of users. Thus, one can restrict access to a file server to only those who need it, rather than letting anyone inside the company pound on it," Bellovin states in his paper.

In Bellovin's view, the distributed firewall on servers and desktops should provide a mechanism for policy control administered through systems management tools, augmented with intrusion detection and preferably, IP Security-based encryption.

### Falling short

However, the products available today fall far short of that vision. Network-1 CEO Avi Fogel acknowledges the CyberWallPlus line for server and desktop firewalls has no reporting capability. Check Point's personal desktop firewall also can't be reconfigured. "Today, it's one policy for all," says Greg Smith, Check Point's director of marketing.

Axent Technologies, which markets the Raptor perimeter firewall, has had a personal desktop firewall out for about

three months. There's no central way to manage it, though that's expected to change in a future release.

Some security vendors have mixed feelings about distributed firewalls.

Network Associates bought the company Signal 9 six months ago for the firm's personal desktop firewall, and the company is now adding alerting and reporting to it so the next release will be an integrated intrusion-detection, firewall and VPN product.

But Mark McArdle, a vice president in Network Associates' managed security services division, questions the value of running firewall software directly on the Web server. The traditional method involves placing a firewall on a separate box in front of the server for departmental LANs or at the perimeter.

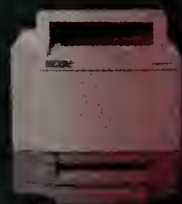
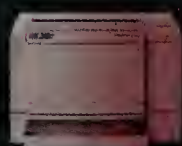
"Applications on servers are usually managed by different people than the ones who manage firewalls," McArdle says. "Application servers tend to be changed with a little more of a cavalier attitude, which could affect the fire-

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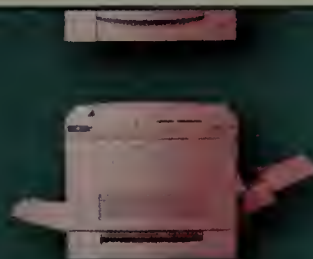
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# Infrastructure

TCP/IP, LAN/WAN Switches, Routers, Hubs, Access Devices,  
Clients, Servers, Operating Systems, VPNs, Networked Storage

## Briefs

Cisco last week will roll out a LAN switch for midsize companies looking to deploy IP telephony networks. The Catalyst 3524-PWR XL features 24 10/100M bit/sec Ethernet ports and two 1000M bit/sec Gigabit Interface Connector ports. The switch features inline power and quality-of-service (QoS) enhancements specifically designed for IP telephony. With integrated inline power, the Catalyst 3524-PWR XL detects the type of IP device on each port, such as an IP phone, and powers it using 48-volt DC power over Category 5 unshielded twisted pair cable. With inline power, an uninterruptible power supply or separate wall power is not required for each IP phone, Cisco says. Cisco recommends deployment of redundant power supplies to back up switch power, however.

For QoS, the Catalyst 3524-PWR XL supports port-based reclassification, allowing users to change IEEE 802.1p class-of-service settings on a per-port basis. This enables users to prioritize voice traffic ahead of file transfers or Web surfing, Cisco says.

The Cisco Catalyst 3524-PWR XL is available now for \$3,995.

Cisco: [www.cisco.com](http://www.cisco.com)

3Com last week announced the 3Com OfficeConnect 812 ADSL Router for small businesses. The 3Com OfficeConnect 812 ADSL Router supports G.lite and full-rate DSL speeds. The router connects directly to any Ethernet interface on a PC or connects multiple workstations with an integrated 10Base-T hub. It supports network address translation and filtering functions, and up to 16 virtual concurrent connections to multiple destinations, 3Com says. The OfficeConnect 812 ADSL Router is available for \$599.

3Com: [www.3com.com](http://www.3com.com)

## Juniper, Foundry size up router race

CEO Kriens says only Juniper and Cisco will survive; CEO Johnson says Foundry's in the fight.

BY JIM DUFFY

SANTA CLARA — Even though the market for Internet core routers will be worth \$10 million in three to five years, only two players will split that pie, says Juniper Networks CEO Scott Kriens.

Kriens, naturally, is very bullish on Juniper's prospects for being one of those two combatants. Currently, Juniper owns 9% of the \$1 billion combined market for Internet core routers, ATM switches and IP/ATM switches, according to market tracker RHK in South San Francisco.

Cisco owns 48% of the market and Lucent is second with 27%. But Lucent's share is mostly in ATM switches, an area where Juniper does not play. So Cisco and Juniper are No. 1 and No. 2 in Internet core routing.



Kriens thinks it will stay that way.

"This market is going to attract a lot of interest and announcements," he says. "But an indication of success or failure is

**"There's probably not room for more than two competitors [in Internet core routing]."**

Scott Kriens, Juniper Networks CEO

market share. There's probably not room for more than two competitors."

The barriers to entry for other contestants are the dependency and investment service providers have in a select few vendors, Kriens says. Service providers don't want to deal with multiple vendors for something as vital as their IP service infrastructures.

Also, new entrants have to propose something that's fundamentally unavailable today in the Internet. Simple speeds and feeds, and claims of zero packet loss when all quality-of-service, Multi-protocol Label Switching (MPLS) and security features are turned on just won't cut it anymore.

"It's a pretty tall order," Kriens says. "But we take each legitimate product set seriously and watch all announcements."

One company that plans to be taken seriously as a core network equipment provider player is Foundry Networks. Foundry, which began life four years ago as a Gigabit Ethernet start-up focused on the enterprise, entered the Internet core routing market earlier this year with the NetIron line.

See **CEOs**, page 24

## Nortel revs up hybrid communications server

BY JAMES NICCOLAI

RICHARDSON, TEXAS — Nortel Networks at the end of this month plans to release an upgraded version of Enterprise Edge, its communications server designed to help small and mid-size businesses integrate voice and data traffic into a single network, company officials say.

Enterprise Edge 2.0 will include expanded IP features, including Dynamic Host Configuration Protocol, Domain Name System caching, and firewall support. The server also will sport a faster Pentium III processor.

The 19-inch rack-mounted system is aimed at companies interested in combining some of their voice and data traffic over a single IP network. Along with rival Cisco, Nortel has been championing integrated networks, saying they can lead to reduced management and operational costs and open the door for new types of messaging applications.

Enterprise Edge integrates traditional PBX functions with packet-switch capa-

bilities, including voice-over-IP and quality-of-service data routing. At its heart are a call server built around Nortel's Media Services Card (MSC) and an applications server based on an embedded version of Windows NT.

Nortel designed the server so that if the NT component crashed, the MSC server would continue to exchange circuit-switched calls, says Richard Solosky, director of portfolio marketing for Nortel's small business solutions group.

Enterprise Edge can assign policy for different types of data, giving voice traffic priority over text files, for example. Nortel is developing a policy switch that will function as an add-on to Enterprise Edge to let administrators set policy for individual users or groups of users. The switch is due to ship worldwide in the third quarter, Solosky says.

Looking further ahead, Nortel is working to include digital DSL and VPN capabilities directly into Enterprise Edge, with the goal of making VPNs more affordable for smaller businesses.

[www.nwfusion.com](http://www.nwfusion.com)

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For the DSL component, Nortel is developing a DSL card in PCI Card format that will plug directly into the communications server.

"Our goal is to reduce the entry point for VPN down to the 10- or 20-user level," Solosky says.

Nortel Networks: [www.nortel.com](http://www.nortel.com)

Niccolai is a correspondent with the IDG News Service.



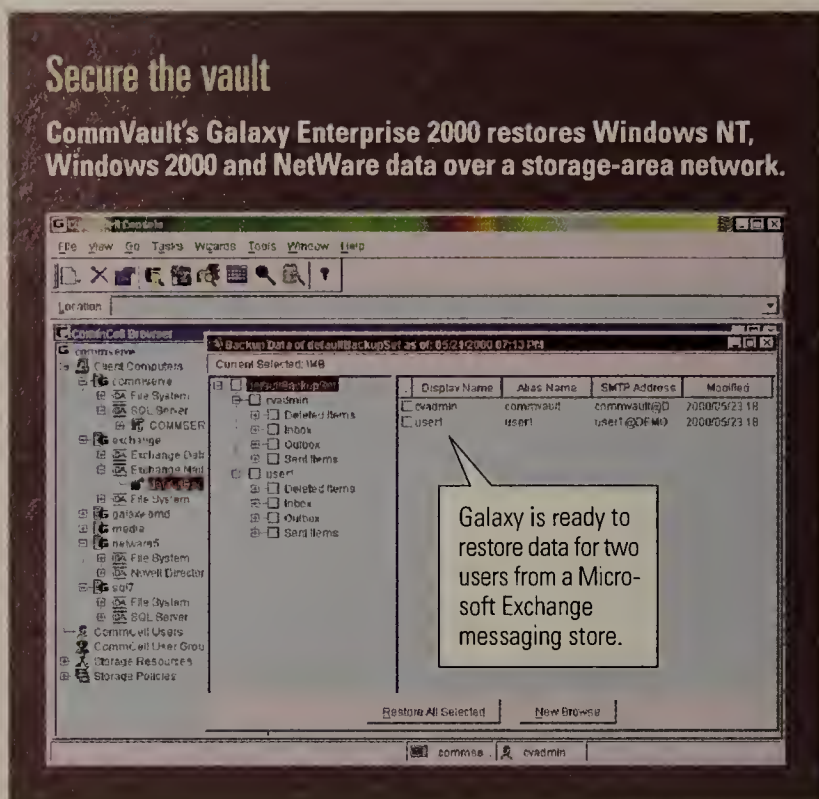
# CommVault bolsters network back-up package

BY DENI CONNOR

CommVault introduced software last week that makes it easier for customers with mixed Windows NT, Windows 2000 and NetWare servers to back up and recover files.

Galaxy Enterprise 2000 back-up and recovery software lets network professionals back up data by user rather than by machine and directory. For instance, if User X loses files he needs, the network manager can simply go to the Galaxy menus and locate User X's files to recover them.

"With other back-up software I used, if I wanted to restore e-mail I had to restore the whole mailbox," says Yanal Mash, NT-Exchange administrator for Aveo, a software company in Santa Clara. "With Galaxy, I can restore individual e-mail messages or contacts. The software restores data quickly and in exactly the way I want it. Before, restoration



could take up to two days."

The market for storage management software is growing. In 1999 it totaled \$4.2 billion, a 47% increase over 1998, accord-

ing to Dataquest of Stamford, Conn. The storage management market will reach \$14.7 billion in 2004, the company predicts. Galaxy Enterprise 2000

runs on NT, Win 2000 and NetWare servers and will work with Microsoft Exchange, SQL Server and Microsoft Cluster Server, as well as a variety of storage arrays, Just a Bunch of Disks and tape libraries. The package also provides LAN-free back-up capability, which lets data that is being saved be removed from the network and pass directly between the storage and back-up device, thus reducing traffic across the network.

From a Windows management console, customers can set policies, monitor events and back up and recover the network. The management software is Microsoft Management

Console compliant. Galaxy Enterprise 2000 supports Microsoft's Active Directory and Novell's NDS Corporate Edition.

A release of CommVault Galaxy Enterprise 2000 later this summer will add support for Lotus Notes R5 and Domino servers and Network Appliance file servers. Additional network-attached storage support will be available this fall.

CommVault, formerly a business unit of AT&T Network Services, has signed an agreement through which Microsoft will also resell Galaxy. The software is \$1,000 per server.

CommVault: [www.commvault.com](http://www.commvault.com)

CEOs,

continued from page 23

"During the last year it was a two-horse race, now it's a three-horse race," says Bobby Johnson, Foundry's CEO. "We've been shipping [the Border Gateway Protocol] longer than Juniper's been shipping product."

Foundry has its work cut out for it, though. Foundry's Net-iron1500 router delivers impressive performance and scaling characteristics, but the company faces long-term challenges in selling and marketing the product in the Internet core market, says market tracker CurrentAnalysis in Sterling, Va.

in the next six months, the next 24 months could be interesting.

"Over time, we certainly plan to level the playing field," Johnson says.

Sixty percent of Foundry's business is with service providers, and seven of the top 10 ISPs are Foundry customers, Johnson says. America Online has \$30 million of Foundry equipment installed, and Foundry has sold \$10 million worth of packet-over-SONET (POS) interfaces, he says.

"We focus mostly on POS," Johnson says. "We're more for the pure IP and SONET play."

Nonetheless, Foundry will soon add ATM WAN interfaces

## Marathon boosts Win NT server performance

BY DENI CONNOR

BOXBOROUGH, MASS. — Marathon Technologies is introducing a multiprocessor version of its software and hardware that promises higher data throughput for Windows NT Server users.

Endurance 6200 software and hardware includes several new features, such as support for two processors and multi-mode fiber-optic cable, which is easier to connect and more reliable. In addition, the Endurance 6200 has improved network adapters that with the assistance of multiprocessing support should provide a four-fold boost in server throughput over the firm's existing products, the company says.

"We are looking for a quicker method of importing trades in real time every day," says Brian Slattery, manager of server support for First Options of Chicago, a securities trading firm. "Most of the time our software can't keep up. When there are system problems due to the exchanges, the time it takes to catch up puts too great a load on a single processor."

Slattery has used other clustering and failover software. "They gave us as much as a minute of downtime. They weren't good enough. Each minute costs money in our business," he says.

The Marathon package supports higher-resolution video and more colors for use in graphics and manufacturing environments. The Endurance client, formerly only available on NT platforms, now supports Windows 95 and 98 clients. The system also now supports Fibre Channel-based storage.

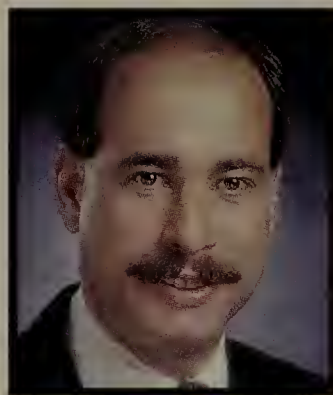
In an Endurance-enabled

configuration, four servers are joined in an array that emulates a single server. Two servers called compute elements perform the application processing in lock-step fashion; the other two dubbed I/O processors perform all inbound and outbound IO requests. In each server, a Marathon network interface adapter joins to network interfaces in other servers in the array via fiber-optic cable. In the event of a server failure, the other server in the I/O processors pair takes over processing and operations continue uninterrupted.

System management is performed from the Endurance Manager software, a Windows-based, as well as browser-based, interface. The management software allows management, monitoring and maintenance of the system.

The Endurance 6200 package is \$50,000 and is available immediately.

[www.marthontechologies.com](http://www.marthontechologies.com)



**"During the last year it was a two-horse race, now it's a three-horse race."**

Bobby Johnson, Foundry Networks CEO

"Foundry can assert pricing and performance claims that can cause some consternation for Internet core routing market leaders Cisco and Juniper, although the firm has yet to prove that it can be a long-term factor" in the market, CurrentAnalysis stated in a recent report.

Johnson remains undaunted. Although he has no intentions of overtaking Cisco or Juniper

and MPLS capabilities to its products. The company will also ship OC-192 interfaces on its NetIron and BigIron routers and switches in the fourth quarter, Johnson says.

The proof of the pudding though, says Kriens, will be performance in the Internet core.

"The Internet is an effective vehicle for proving product capability," he says. ■

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*[ looks like this ]*

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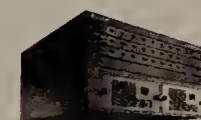
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# NaviSite, ArrowPoint team for apps services

BY APRIL JACOBS

Marry technologies from switch maker ArrowPoint with ASP NaviSite and what do you get? A way to give enterprise users the goods to manage their e-commerce and business-to-business applications the same way they manage Web site content.

The joint development deal the two firms are working on calls for ArrowPoint to develop new features for the software that runs on its switches and NaviSite to offer new services that work with those feature sets. The result should be a way for users to provide better application services to their employees and the people they do business with.

NaviSite Chief Technology Officer Peter Kirwan says his firm is looking to take the next step in solving one of the biggest problems faced by companies using applications that run over the Internet: How to provide quality-of-service agreements for companies



NaviSite will offer new services based on the features found in ArrowPoint's CS150 switches.

with users around the world both inside and outside of their corporate networks. Kirwan says the two companies will offer the technology in pieces over the next several months but didn't offer specifics for pricing and feature availability.

What is clear is that in order for users

to get reliable application services, ASPs and switch makers will have to find a way to deal with issues such as reliability and speed of servers and network performance in a data center environment, says Peter Firstbrook, an analyst at Meta Group in Stamford, Conn.

"There are still ducks to be gotten in a row [by ASPs], but being able to provide time-sensitive applications over the Internet is what ASPs need to do," Firstbrook says. "And anything they can do to get rid of network latency is going to be good for end users." Providing tools to help process end-user requests more efficiently should help alleviate latency problems.

To solve problems associated with managing applications hosted at data centers, such as latency, NaviSite and ArrowPoint are borrowing some methods used in content delivery. By routing users' requests to the data center closest to them, the applications and data requested by users will arrive more

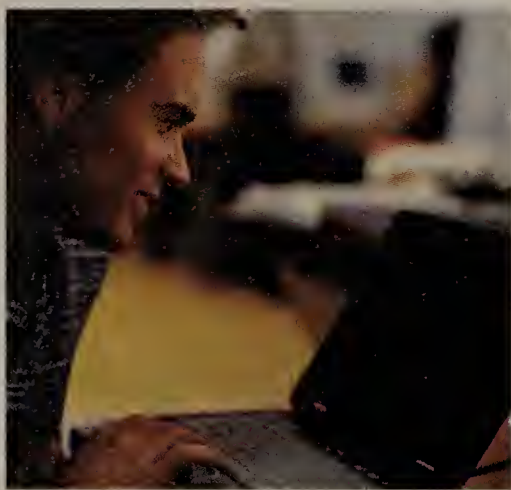
quickly than from an arbitrary or central location. NaviSite and ArrowPoint will provide separate pieces of what is needed, Kirwan says.

For example, ArrowPoint will add features to its switch software that are designed to take advantage of application management and monitoring services offered by NaviSite. Kirwan says the services and switch features will be released over the next several months.

At least one feature on the ArrowPoint switches will determine where an application end user is routed, based on the user's profile. NaviSite's software will provide monitoring and management tools that optimize server and network performance, allowing changes to be made if performance isn't what it's supposed to be. For example, streaming servers in different data centers could be linked and tapped to provide streaming applications if one couldn't get the job done.

Kirwan says the firm is also looking to let end users develop custom performance metrics for their applications and provide services to improve performance based on the metrics.

NaviSite: [www.navisite.com](http://www.navisite.com)



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—THOMAS JEFFERSON [FOR THE MOST PART]

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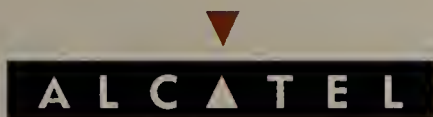
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Wired Windows . Dave Kearns

## WILL GATES LOOK FOR SYMPATHY

I'm in Orlando this week for Microsoft's TechEd conference — a geek-fest right up there with Novell's BrainShare for the title of most acronyms

per minute in a presentation. By the time you read this, the Monday morning opening keynote session will be finished. I'm writing this, though, before it

happens, and it's interesting to speculate on what "William (Bill) H. Gates" (that's what it says in the program) will say.

The prespeech notes I have indicate

that the topic of his talk will be "Microsoft's strategy for Next Generation Web Services (NGWS)." Of course, Microsoft postponed the announcement of NGWS last week, putting off their press and analyst dog-and-pony show (Forum2000) until June 22. Does that mean NGWS will be a no-show in the keynote?

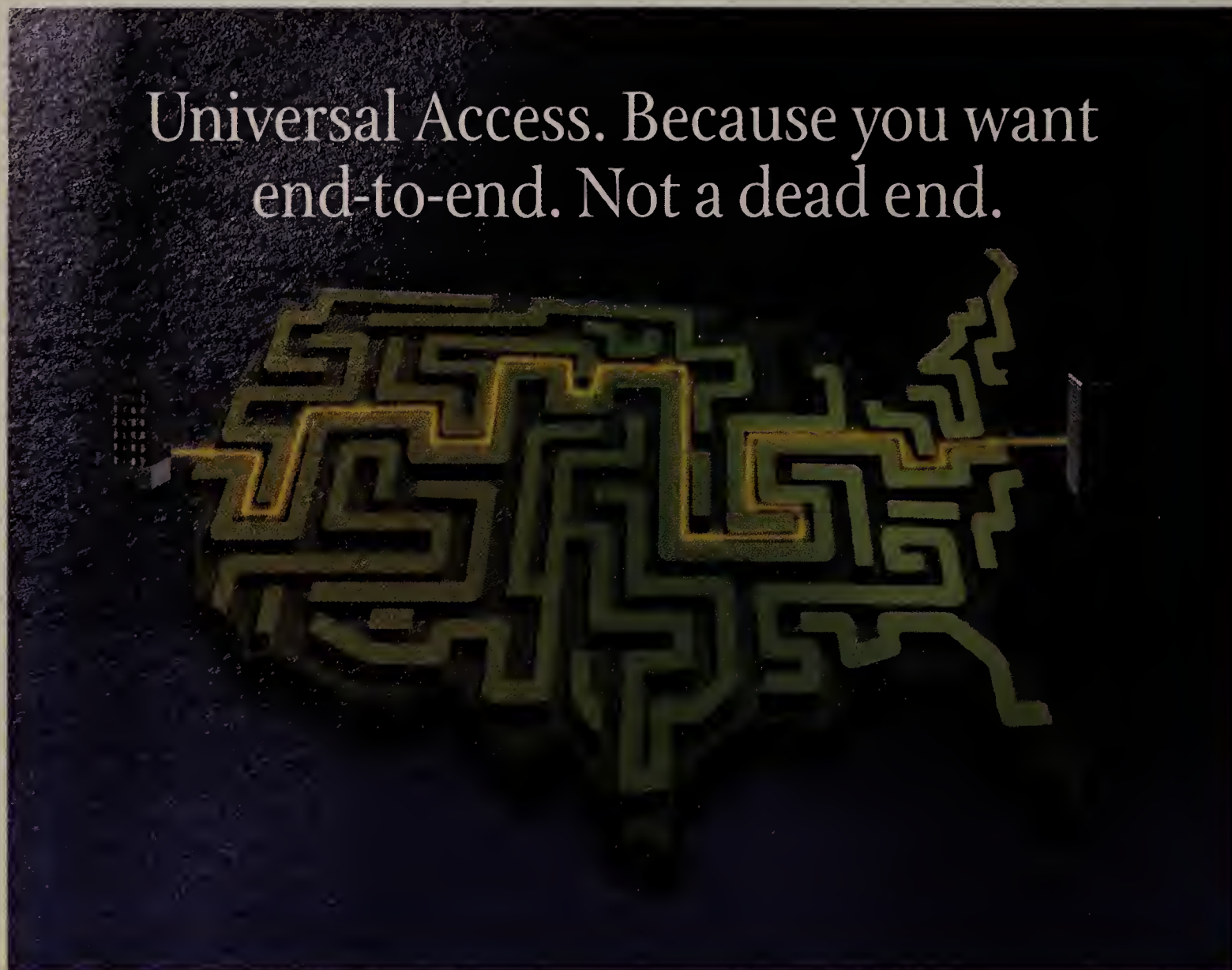
Generally in these events, many of the scheduled sessions (there are 256 at TechEd) tie the technology to the keynote theme — if you went to BrainShare, recall how many times you heard the acronym "DENIM" after Novell's Directory-Enabled Network Infrastructure strategy was introduced at the keynote. So if NGWS is eliminated from the keynote address, will there be blank slides in the presentations?

Or will its time be filled by a discussion of the event that forced the postponement of Forum2000 — the handing down of penalties in the Microsoft antitrust case? Gates has been very reluctant to discuss the trial in any venue where questions might be asked (such as the recent CEO Summit in Redmond, Wash.), but TechEd should be a sympathetic audience — probably the best arena for making Microsoft's case in public.

Whatever Gates does, you can read about it later in the day on Network World Fusion ([www.nwfusion.com/](http://www.nwfusion.com/)) or in next week's issue. You can even watch a replay of the keynote at your leisure at <http://msdn.microsoft.com/events/te/webcast/>, which will also let you view selected sessions of the conference.

If you're at the conference and you see someone who resembles the picture at the top of this page, let me know what you thought of the keynote, the court's judgment, NGWS or anything else. If you want to know my take on the events at TechEd, subscribe to the Focus on Windows Networking newsletter ([www.nwfusion.com/focus/](http://www.nwfusion.com/focus/)) where I'll give you the inside view over the next couple of weeks.

*Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at [wired@vquill.com](mailto:wired@vquill.com).*



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### Tip of The Week



After much speculation about the death of NetWare, the recent Novell corporate realignment — and conversations with Novell insiders — led me to decide that there was a future for the granddaddy of network operating systems. Details can be found in this week's Focus on NetWare newsletter ([www.nwfusion.com/focus/](http://www.nwfusion.com/focus/)).



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**Pinnacle Award**

Pinnacle Award winner for service and innovation, *X-Change* and *Phone+* magazines

**Data  
Communications**

Top 25 ISP, *Data Communications* magazine 1999 and 1998

**Forbes  
ASAP**

"Dynamic100" Top Technology Company rankings, *Forbes ASAP* magazine 1999 and 1998

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Top 100 Growth Company and "Hot Growth Company," *Network World* magazine 1999

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### 1. What is the principal business activity at your location? (check ONE only)

- |   |  |  |
|---|--|--|
| 01. <input type="checkbox"/> Manufacturing (other)  | 10. <input type="checkbox"/> Education   | 19. <input type="checkbox"/> Systems/Network Integrators*            |
| 02. <input type="checkbox"/> Finance/Banking  | 11. <input type="checkbox"/> Government  | 20. <input type="checkbox"/> Distributors (Computer/Communications)* |
| 03. <input type="checkbox"/> Insurance/Real Estate/Legal  | 12. <input type="checkbox"/> Military  | 21. <input type="checkbox"/> Other (please specify)                  |
| 04. <input type="checkbox"/> Health Care Services   | 13. <input type="checkbox"/> Aerospace   |  |
| 05. <input type="checkbox"/> Hospitality/Entertainment/Recreation   | 14. <input type="checkbox"/> Consulting (Independent)*                           |  |
| 06. <input type="checkbox"/> Media/TV/Cable/Radio/Print   | 15. <input type="checkbox"/> Carriers/Service Providers                          |  |
| 07. <input type="checkbox"/> Retail/Wholesale Trade/Business Services   | 16. <input type="checkbox"/> Internet Service Provider (ISP)                     |  |
| 08. <input type="checkbox"/> Transportation   | 17. <input type="checkbox"/> Manufacturing (Computer/Communications/OEM)         |  |
| 09. <input type="checkbox"/> Utilities/Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry) | 18. <input type="checkbox"/> Resellers of Computer/Network Products (VARs,VADs)* |  |

\*Attn Consultants, Integrators, Distributors, Resellers: Please complete entire form based on ALL clients and your own business needs

### 2. P: What is your primary job function? (check ONE only) S: What is your secondary job function? (check ALL that apply)

- |  |  |   |   |  |   |
|--|--|---|---|--|---|
| P  | S  | P   | S | P  | S |
| <input type="checkbox"/> 1. Network Management                   | <input type="checkbox"/> 5. Internet/Intranet/E-Commerce Mgmt, Webmaster | <input type="checkbox"/> 7. Corporate Management (CEO, COO, CFO, Pres., VP, Dir., Mgr.) |   | <input type="checkbox"/> 8. Consultant (Independent) |   |
| <input type="checkbox"/> 2. LAN Management                       | <input type="checkbox"/> 6. Engineering Management                       | <input type="checkbox"/> 9. Other (please specify)                                      |   |  |   |
| <input type="checkbox"/> 3. Datacom/Telecom Management           |  |   |   |  |   |
| <input type="checkbox"/> 4. IS/IT/MIS/CIO/CTO/Systems Management |  |   |   |  |   |

### 3. What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of? (Please print the appropriate number code on the line next to each product category. Please complete ALL categories A-N.)

- |                                   |   |   |   |                                 |
|-----------------------------------|---|---|---|---------------------------------|
| 1. \$100 Million or more          | A | Large Systems (Mainframes/Minis)            | G | Internetworking                 |
| 2. \$50 Million to \$99.9 Million |   |   | H | Internet                        |
| 3. \$25 Million to \$49.9 Million | B | Desktops (Micros/Laptops/Workstations/PDAs) | I | Intranet                        |
| 4. \$10 Million to \$24.9 Million |   |   | J | Extranet/E-Commerce             |
| 5. \$1 Million to \$9.9 Million   | C | Servers                                     | K | Remote Access                   |
| 6. \$100,000 to \$999,999         | D | LANs  | L | Peripherals (including storage) |
| 7. \$50,000 to \$99,999           | E | WAN Equipment                               | M | Software                        |
| 8. Under \$50,000                 | F | Carrier Services                            | N | Service/Support                 |
| 9. None of the above              |   |   |   |                                 |

### 4. What is the total number of sites for which you have purchase influence? (check ONE only)

1. ☐ 100+ 2. ☐ 50 - 99 3. ☐ 20 - 49 4. ☐ 10 - 19 5. ☐ 2 - 9 6. ☐ 1 7. ☐ None

### 5. What is the total number of Servers/Clients/LANs installed/planned at your location/in your entire organization? (check ONE box in each column)

SERVERS		CLIENTS		LANs	
At Location	Entire Org.	At Location	Entire Org.	At Location	Entire Org.
A	B	C	D	E	F
<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>
<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>
<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>
<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>	<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>	<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>
<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>	<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>	<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>
<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>
<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>
<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>

### 6. What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check ONE only)

- CORPORATE:  
1. ☐ Entire Enterprise/Multiple Enterprises  
2. ☐ Division/Multiple Divisions  
3. ☐ Department  
4. ☐ None

B. Involvement (check ALL that apply)

1. ☐ Create Network/IT Strategy  
2. ☐ Recommend/Specify Brand  
3. ☐ Approve Purchase  
4. ☐ Evaluate Products/Services  
5. ☐ Determine the Need  
6. ☐ None

### 7. What is the estimated number of employees at your location/in entire organization? (check ONE in each section)

- |   |   |   |  |
|---|---|---|--|
| A. At your location:                        | B. Entire organization:                     |   |  |
| 1. <input type="checkbox"/> Over 20,000     | 1. <input type="checkbox"/> Over 20,000     | 5. <input type="checkbox"/> 1,000 - 2,499 |  |
| 2. <input type="checkbox"/> 10,000 - 19,999 | 2. <input type="checkbox"/> 10,000 - 19,999 | 6. <input type="checkbox"/> 500 - 999     |  |
| 3. <input type="checkbox"/> 5,000 - 9,999   | 3. <input type="checkbox"/> 5,000 - 9,999   | 7. <input type="checkbox"/> 499 or less   |  |
| 4. <input type="checkbox"/> 2,500 - 4,999   | 4. <input type="checkbox"/> 2,500 - 4,999   |   |  |
| 5. <input type="checkbox"/> 1,000 - 2,499   |   |   |  |

### 8. Please indicate the Internet/Intranet/LAN/WAN products/services that you are currently involved in purchasing or plan to purchase (check ALL that apply)

A. Currently involved in purchasing

B. Plan to purchase

#### INTERNET/INTRANET

- |  |   |  |   |  |   |
|--|---|--|---|--|---|
| A  | B   | A  | B | A  | B |
| <input type="checkbox"/> 01. VPN Equipment                 | <input type="checkbox"/> 07. Voice/Video Over IP (IP Multicast Routing) | <input type="checkbox"/> 12. Management/Monitoring Software    |   | <input type="checkbox"/> 13. Web Based Management Tools      |   |
| <input type="checkbox"/> 02. VPN Services                  | <input type="checkbox"/> 08. Internet Services                          | <input type="checkbox"/> 14. Web Based Collaboration/Groupware |   | <input type="checkbox"/> 15. Caching/Load Balancing Products |   |
| <input type="checkbox"/> 03. Firewalls/Security/Encryption | <input type="checkbox"/> 09. Web Hosting                                | <input type="checkbox"/> 16. Other Internet/Intranet           |   |  |   |
| <input type="checkbox"/> 04. Electronic Commerce           | <input type="checkbox"/> 10. Host Access                                |  |   |  |   |
| <input type="checkbox"/> 05. Web Servers/Software          | <input type="checkbox"/> 11. Web Development Tools                      |  |   |  |   |
| <input type="checkbox"/> 06. Web Enabled Call Center Tools |   |  |   |  |   |

#### LOCAL-AREA NETWORKS/INTERNETWORKING

- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| A  | B   | A   | B | A   | B |
| <input type="checkbox"/> 17. Local-Area Networks                     | <input type="checkbox"/> 25. Layer 2 Switches                           | <input type="checkbox"/> 33. UPS                                  |   | <input type="checkbox"/> 34. Network Interface Cards (NICs, PCMCIA) |   |
| <input type="checkbox"/> 18. Network Operating System Software (NOS) | <input type="checkbox"/> 26. Layer 3 Switches                           | <input type="checkbox"/> 35. Hubs/Intelligent Hubs/Stackable Hubs |   | <input type="checkbox"/> 36. Cables/Connectors, Baluns              |   |
| <input type="checkbox"/> 19. Intel Based Servers                     | <input type="checkbox"/> 27. Layer 4 Switches                           | <input type="checkbox"/> 37. SNMP Platform                        |   | <input type="checkbox"/> 38. Management Frameworks                  |   |
| <input type="checkbox"/> 20. Intel Based Multiprocessor Servers      | <input type="checkbox"/> 28. ATM Switches                               | <input type="checkbox"/> 39. Other LAN/Internetworking            |   |   |   |
| <input type="checkbox"/> 21. RISC Based Servers                      | <input type="checkbox"/> 29. Token-Ring Switches                        |   |   |   |   |
| <input type="checkbox"/> 22. Clustered Servers                       | <input type="checkbox"/> 30. Network Storage (NAS, SANs)                |   |   |   |   |
| <input type="checkbox"/> 23. Print Servers                           | <input type="checkbox"/> 31. Storage/Backup (Optical, Disk, Tape, RAID) |   |   |   |   |
| <input type="checkbox"/> 24. Routers                                 | <input type="checkbox"/> 32. Network Test/Diagnostic Tools              |   |   |   |   |

#### WAN EQUIPMENT & SERVICES

- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| A  | B   | A   | B | A   | B |
| <input type="checkbox"/> 40. Modems                                | <input type="checkbox"/> 46. Remote Access Services           | <input type="checkbox"/> 53. PBXs                         |   | <input type="checkbox"/> 54. Videoconferencing    |   |
| <input type="checkbox"/> 41. Cable Modems                          | <input type="checkbox"/> 47. Wireless Data Equipment/Services | <input type="checkbox"/> 55. Managed LAN/Router Services  |   | <input type="checkbox"/> 56. Fax Servers/Services |   |
| <input type="checkbox"/> 42. Asynchronous Transfer Mode (ATM)      | <input type="checkbox"/> 48. ISDN Equipment/Services          | <input type="checkbox"/> 57. Other WAN Equipment/Services |   |   |   |
| <input type="checkbox"/> 43. Frame Relay Equipment Including FRADS | <input type="checkbox"/> 49. FT-1/T-1/T-3 Services            |   |   |   |   |
| <input type="checkbox"/> 44. Frame Relay Services                  | <input type="checkbox"/> 50. xDSL Services/Products           |   |   |   |   |
| <input type="checkbox"/> 45. Remote Access Products                | <input type="checkbox"/> 51. Diagnostic/Test Equipment        |   |   |   |   |
|  | <input type="checkbox"/> 52. DSU/CSU                          |   |   |   |   |

None of the above (1 - 57) ☐ 58. ☐

### 9. Please indicate the Network hardware/software/services that you are currently involved in purchasing or plan to purchase: (check ALL that apply)

A. Currently involved in purchasing

B. Plan to purchase

#### COMPUTERS/PERIPHERALS

- |   |  |  |   |  |   |
|---|--|--|---|--|---|
| A   | B  | A  | B | A  | B |
| <input type="checkbox"/> 01. Laptops/Notebooks/PDAs         | <input type="checkbox"/> 05. Storage/Backup (Optical, Disk, Tape, RAID)          | <input type="checkbox"/> 08. Minis                       |   | <input type="checkbox"/> 09. Mainframes                |   |
| <input type="checkbox"/> 02. PCs                            | <input type="checkbox"/> 06. Printers  | <input type="checkbox"/> 10. Fax/Modem Boards            |   | <input type="checkbox"/> 11. Memory/Chips/Boards/Cards |   |
| <input type="checkbox"/> 03. Windows Terminals/Thin Clients | <input type="checkbox"/> 07. Printer/Fax/Copier Hybrids (Multifunction Printers) | <input type="checkbox"/> 12. Other Computers/Peripherals |   |  |   |
| <input type="checkbox"/> 04. Workstations                   |  |  |   |  |   |

#### SOFTWARE/APPLICATIONS

- |   |   |  |   |   |   |
|---|---|--|---|---|---|
| A   | B   | A  | B | A   | B |
| <input type="checkbox"/> 13. Network Management             | <input type="checkbox"/> 21. E-Mail                             | <input type="checkbox"/> 28. Site Metering Tools         |   | <input type="checkbox"/> 29. Data Warehousing |   |
| <input type="checkbox"/> 14. Systems Management             | <input type="checkbox"/> 22. Enterprise Resource Planning (ERP) | <input type="checkbox"/> 30. Anti Virus Software         |   | <input type="checkbox"/> 31. Multimedia       |   |
| <input type="checkbox"/> 15. Security                       | <input type="checkbox"/> 23. EDI                                | <input type="checkbox"/> 32. Y2K Conversion Software     |   | <input type="checkbox"/> 33. Helpdesk         |   |
| <input type="checkbox"/> 16. Directory Services             | <input type="checkbox"/> 24. Desktop Videoconferencing          | <input type="checkbox"/> 34. Other Software/Applications |   |   |   |
| <input type="checkbox"/> 17. Operating Systems              | <input type="checkbox"/> 25. Imaging                            |  |   |   |   |
| <input type="checkbox"/> 18. Applications Development Tools | <input type="checkbox"/> 26. Middleware/Serverware              |  |   |   |   |
| <input type="checkbox"/> 19. Database Management/RDBMS      | <input type="checkbox"/> 27. Document Management                |  |   |   |   |
| <input type="checkbox"/> 20. Groupware                      |   |  |   |   |   |

#### SERVICES

- |   |   |  |   |   |   |
|---|---|--|---|---|---|
| A   | B   | A  | B | A   | B |
| <input type="checkbox"/> 35. BPO (Business Process Outsourcing incl. Financial Services, HR, Logistics, etc.) | <input type="checkbox"/> 36. Applications Outsourcing       | <input type="checkbox"/> 39. Education/Training Services |   | <input type="checkbox"/> 40. Other Services |   |
|   | <input type="checkbox"/> 37. Call Center Outsourcing        |  |   |   |   |
|   | <input type="checkbox"/> 38. Systems Integration/Consulting |  |   |   |   |

None of the above (1 - 40) ☐ 41. ☐

### 10. Please indicate the platforms that are currently installed/planned: (check ALL that apply)

A. Currently installed

B. Planned for purchase

#### NETWORK PROTOCOLS

- |                                     |   |  |   |                                   |   |
|-------------------------------------|---|--|---|-----------------------------------|---|
| A                                   | B   | A  | B | A                                 | B |
| <input type="checkbox"/> 01. TCP/IP | <input type="checkbox"/> 04. Novell IPX/SPX   | <input type="checkbox"/> 07. NFS                     |   | <input type="checkbox"/> 08. SNMP |   |
| <input type="checkbox"/> 02. IPv6   | <input type="checkbox"/> 05. APPC/APPN/LU 6.2 | <input type="checkbox"/> 09. Other Network Protocols |   |                                   |   |
| <input type="checkbox"/> 03. SNA    | <input type="checkbox"/> 06. NETBIOS/NETBUEI  |  |   |                                   |   |

#### LAN/WAN ENVIRONMENT

- |  |  |   |   |  |   |
|--|--|---|---|--|---|
| A  | B  | A   | B | A  | B |
| <input type="checkbox"/> 10. Gigabit Ethernet                | <input type="checkbox"/> 16. IP Switching        | <input type="checkbox"/> 22. Wireless                         |   | <input type="checkbox"/> 23. DSL                       |   |
| <input type="checkbox"/> 11. Switched Ethernet               | <input type="checkbox"/> 17. Layer 3,4 Switching | <input type="checkbox"/> 24. ISDN                             |   | <input type="checkbox"/> 25. Frame Relay               |   |
| <input type="checkbox"/> 12. Fast Ethernet                   | <input type="checkbox"/> 18. FDDI                | <input type="checkbox"/> 26. Private Line T1, T3, FT-1, SONET |   | <input type="checkbox"/> 27. Other LAN/WAN Environment |   |
| <input type="checkbox"/> 13. Ethernet                        | <input type="checkbox"/> 19. 100Base-T           |   |   |  |   |
| <input type="checkbox"/> 14. ATM                             | <input type="checkbox"/> 20. 10Base-T            |   |   |  |   |
| <input type="checkbox"/> 15. Token Ring/Token Ring Switching | <input type="checkbox"/> 21. Fibre Channel       |   |   |  |   |

#### NETWORK OPERATING SYSTEM

- |   |  |   |   |   |   |
|---|--|---|---|---|---|
| A   | B  | A   | B | A   | B |
| <input type="checkbox"/> 28. Windows NT/Windows 2000  | <input type="checkbox"/> 32. LINUX                   | <input type="checkbox"/> 35. IBM (LAN Server) |   | <input type="checkbox"/> 36. Other Network Operating System |   |
| <input type="checkbox"/> 29. Novell (NetWare 5.X)     | <input type="checkbox"/> 33. Microsoft (LAN Manager) |   |   |   |   |
| <input type="checkbox"/> 30. Novell (NetWare 4.X)     | <input type="checkbox"/> 34. Banyan (Vines)          |   |   |   |   |
| <input type="checkbox"/> 31. Novell (NetWare 2.X,3.X) |  |   |   |   |   |

#### COMPUTER OPERATING SYSTEM

- |  |   |  |   |  |   |
|--|---|--|---|--|---|
| A  | B   | A  | B | A                                      | B |
| <input type="checkbox"/> 37. NT Workstation                  | <input type="checkbox"/> 42. LINUX              | <input type="checkbox"/> 47. Digital VMS                     |   | <input type="checkbox"/> 48. Macintosh |   |
| <input type="checkbox"/> 38. Windows 2000                    | <input type="checkbox"/> 43. DOS                | <input type="checkbox"/> 49. Other Computer Operating System |   |  |   |
| <input type="checkbox"/> 39. Windows 98/95/3.1               | <input type="checkbox"/> 44. OS/2, OS/2 WARP    |  |   |  |   |
| <input type="checkbox"/> 40. Intel based UNIX                | <input type="checkbox"/> 45. OS/400             |  |   |  |   |
| <input type="checkbox"/> 41. RISC based UNIX (incl. SOLARIS) | <input type="checkbox"/> 46. IBM MVS/VM/VSE/ESA |  |   |  |   |

None of the above (1 - 49) ☐ 50. ☐

### 11. Which of the following hardware platforms are installed/planned in your company? (check ALL that apply)

A - Mainframes (Large Scale)

1. ☐ IBM  
2. ☐ Other

B - Minis (Midrange)

1. ☐ IBM RS/6000  
2. ☐ IBM AS/400  
3. ☐ Digital/Tandem/Compaq  
4. ☐ Unisys  
5. ☐ H-P  
6. ☐ Other

C - Workstations

1. ☐ Sun Microsystems  
2. ☐ H-P  
3. ☐ Digital/Compaq  
4. ☐ IBM  
5. ☐ Silicon Graphics  
6. ☐ Other

### 12. What is the estimated gross revenue of your entire company/institution? (check ONE only)

- |  |  |   |
|--|--|---|
| 1. <input type="checkbox"/> \$20 Billion or More             | 5. <input type="checkbox"/> \$100 Million to \$499.9 Million | 9. <input type="checkbox"/> \$4.9 Million or less |
| 2. <input type="checkbox"/> \$10 Billion to \$19.9 Billion   | 6. <input type="checkbox"/> \$50 Million to \$99.9 Million   | 10. <input type="checkbox"/> None of the above    |
| 3. <input type="checkbox"/> \$1 Billion to \$9.9 Billion     | 7. <input type="checkbox"/> \$10 Million to \$49.9 Million   |   |
| 4. <input type="checkbox"/> \$500 Million to \$999.9 Million | 8. <input type="checkbox"/> \$5 Million to \$9.9 Million     |   |

### 13. For which areas outside of the US do you have purchase influence? (check ALL that apply)

- |                                    |   |   |                                    |
|------------------------------------|---|---|------------------------------------|
| 1. <input type="checkbox"/> Europe | 3. <input type="checkbox"/> South America | 5. <input type="checkbox"/> Middle East | 7. <input type="checkbox"/> Canada |
| 2. <input type="checkbox"/> Asia   | 4. <input type="checkbox"/> Australia     | 6. <input type="checkbox"/> Africa      | 8. <input type="checkbox"/> None   |



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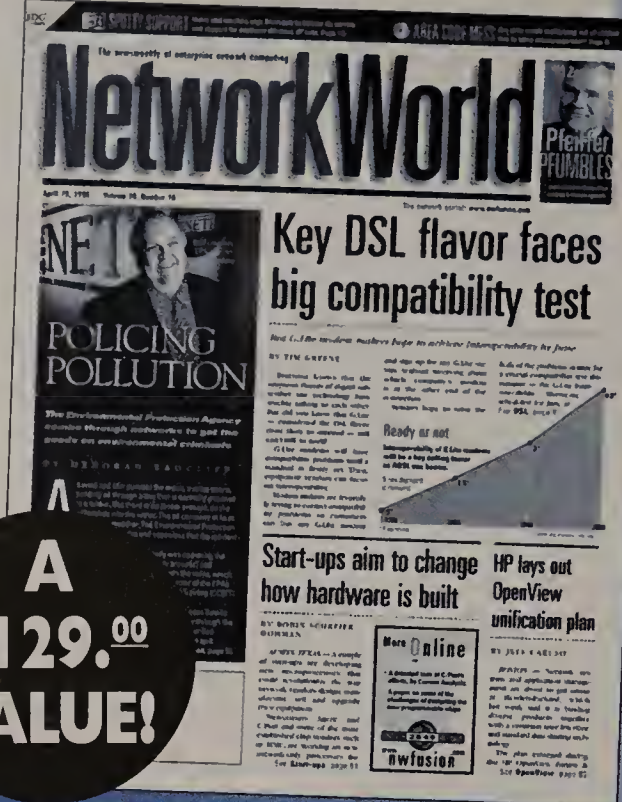
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# Carriers & ISPs

The Internet, Extranets, Interexchange  
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## Briefs

France Telecom last week announced plans to acquire wireless service provider Orange for \$40.2 billion. Vodafone Air-Touch is selling Orange in order to get final regulatory approval for its planned buyout of German telecommunications service provider Mannesmann AG. If France Telecom's acquisition of Orange is approved, France Telecom will own one of the largest wireless service providers in Europe, serving more than 16 countries and 30 million customers.

VPN service provider start-up SmartPipes announced last week that it is using UUNET's nationwide Internet backbone network to launch its VPN offerings later this summer. SmartPipes plans on teaming with multiple service providers to support guaranteed business-class IP network services over multiple ISP backbones, but UUNET — MCI WorldCom's ISP subsidiary — is the first.

SmartPipes: [www.smartpipes.com](http://www.smartpipes.com)

SBC Communications is teaming with Metromedia Fiber Network to deliver local services to cities outside its home service territory. The 20-year, \$432 million deal gives SBC access to fiber in more than half of the 30 cities outside SBC's home turf in which it plans to offer services. That service expansion is part of a deal SBC struck with the Federal Communications Commission in return for permission to buy Ameritech. SBC plans to buy rights to use the fiber and will install its own optical gear to support voice and data services. With its purchase of Ameritech, SBC's home territory covers 13 states, most of them in the Midwest, as well as California and Connecticut.

## Nextlink spreads its wings overseas

CLEC maps European expansion plans to be fueled by \$306 million commitment.

BY DENISE PAPPALARDO

MCLEAN, VA. — Nextlink is expanding its network overseas with a \$306 million investment in dark fiber throughout Europe.

The company is buying local, intercity and transatlantic fiber-optic networks from Level 3 Communications. Nextlink plans on using the capacity to expand the reach of its local and long-distance voice services, Web hosting and Internet access services based on its pending acquisition of ISP Concentric Network.

"Buying dark fiber and building your own network is probably the most cost-effective way to expand overseas in the long run," says Melanie Posey, an analyst with IDC, a Framingham, Mass., consulting firm. It's a good competitive move because Nextlink is among only a few U.S. competitive local exchange carriers (CLEC) that have a presence in Europe's local markets, Posey says.

The local dark fiber that Nextlink is

### The Nextlink expansion

Nextlink is buying \$306 million worth of European network capacity and is also getting a big influx of cash. Here's how its recent deals break down:

- 250 metropolitan route miles that will carry local voice and data traffic.
- 3,700 route miles that will make up Nextlink's European intercity network.
- Trans-Atlantic 2.5G bit/sec connection between New York and London.
- Forstmann Little invests \$400 million in Nextlink.

buying from Level 3 includes facilities in Amsterdam, Brussels, Frankfurt, London and Paris. Nextlink's intercity fiber-optic network will link 21 European cities over 24 fiber strands

that can support transmission speeds up to 19.2 terabits per second.

The dark fiber will be available later this year when Nextlink deploys network gear and fiber-optic electronics such as dense wave division multiplexing devices, which let service providers get the most bandwidth from fiber strands. Nextlink plans on supporting commercial traffic over its European networks in the first half of 2001, says Mike Mecham, vice president of business development at Nextlink.

Level 3 is also supplying Nextlink with a 2.5G bit/sec transatlantic cable that will connect Nextlink's domestic network with its European network. In 2002, Nextlink is expected to boost the capacity on the transatlantic connection up to 10G bit/sec.

Nextlink already has its foot in the door overseas with its planned merger with Concentric. That ISP acquired the Internet Technology Group in the U.K. with customers and data centers in

See **Nextlink**, page 36

## Antislamming law muddies RBOC mergers

BY DAVID ROHDE

Because of a quirk in U.S. telecom law, a potentially confusing shuffle of certain users among carriers involved in mergers is about to begin, even though the mergers haven't yet closed.

The Federal Communications Commission has granted regulatory waivers to Qwest Communications and GTE to begin transitioning certain customers off their networks in advance of their pending mergers, all without the usual paperwork.

The situation has arisen because Qwest and GTE are trying to merge with regional Bell operating companies that lack long-distance authority — Qwest with US West and GTE with Bell Atlantic. Federal law bars RBOCs from escaping long-distance bans by merging with someone else. So Qwest has agreed to sell its business in the US West territory to regional carrier Touch America, while GTE is due to sell its

long-distance business in Bell Atlantic states to Sprint.

The problem is another part of federal telecom law practically bars these same carriers from carrying out these very actions. Under the FCC's rules against "slamming," carriers are forbidden from changing anyone's long-distance preference without explicit

user authorization.

Technically, that means these spin-offs — and the mergers riding on them — can't take place until Qwest and GTE gain individual, explicit permission from every one of the affected customers.

After both carriers argued that that was impossible, the FCC last month granted Qwest and GTE waivers from the antislamming rules to start moving the customers without their explicit permission. Instead of being asked whether they want to make the switch, affected Qwest and GTE customers will simply be told that they are moving to Touch America and Sprint, although they will be allowed to select yet another carrier if they want.

In the FCC orders released last week, GTE also got permission to abrogate another antislamming measure. Because GTE is also a local carrier in a number of states, it offers customers the option of a

See **Antislamming**, page 36

[www.nwfusion.com](http://www.nwfusion.com)

### THE TRUTH ABOUT ANTISLAMMING

Congress has had several bills before it to combat slamming. Find out what the status is on those legislative efforts and what actions are yet to come.

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**Nextlink,**  
continued from page 33

London and Amsterdam. Nextlink expects its merger with Concentric to close this month, according to Mecham.

Nextlink is somewhat familiar with

Europe through Concentric, and it's also familiar with buying dark fiber through its previous relationship with Level 3.

Mecham says Nextlink was looking to mirror its domestic network deployment overseas, which is one of the reasons it teamed with Level 3.

Since 1997 Nextlink has been working with Level 3 to build Internext, Nextlink's national intercity fiber-optic backbone. The Internext network should be finished next year and will connect 50 cities across North America.

While Nextlink is expanding its

networks in Europe and Canada, Mecham says the company has a lot of work ahead as it plans to be an "integrated global service provider." And that's where Forstmann Little comes in.

Nextlink last month received a \$400 million investment from the firm that Nextlink plans to use to fuel its network expansion plans. Asia, Eastern Europe, Australia and Central America are just a few areas where Nextlink still needs a network presence to offer integrated global services.

Nextlink: [www.nextlink.com](http://www.nextlink.com)

**Antislamming,**  
continued from page 33

"preferred carrier freeze" — a technique under which users can tell local carriers to block any long-distance change orders they receive because they're probably from slammers. The FCC gave GTE permission to lift these freezes and move the affected customers to Sprint.

That particular waiver will primarily affect GTE customers in Pennsylvania and Virginia, the two Bell Atlantic states where GTE has significant local territories.

The whole game of musical chairs is already upsetting users and consultants who feel the complexities of RBOC mergers are moving the industry further away from one-stop shopping rather than toward it. And the FCC is now going to some lengths to make sure no one takes the slamming waivers to mean the two mergers are a done deal.

The FCC has not yet ruled on the Bell Atlantic/GTE merger, and although it has conditionally approved the Qwest/US West fusion, it is examining the Touch America spinoff to make sure it passes muster before giving final merger approval. "Our ruling on this waiver does not prejudice in any way the commission's ultimate determination" on the Qwest/US West merger, wrote Carol Matthey, deputy chief of the FCC's Common Carrier Bureau, in the Qwest slamming waiver.

None of the waivers affects GTE's Genuity Internet unit, which is slated to undergo a separate spinoff and in any case — as an ISP — is not subject to regular telecom regulation. On the other hand, Bell Atlantic and GTE customers in New York state will apparently escape all the confusion. The FCC last December granted Bell Atlantic long-distance authority for New York.

As a result, a merged Bell Atlantic/GTE will be able to offer any service there, and GTE isn't shipping any New York customers over to Sprint. ▣



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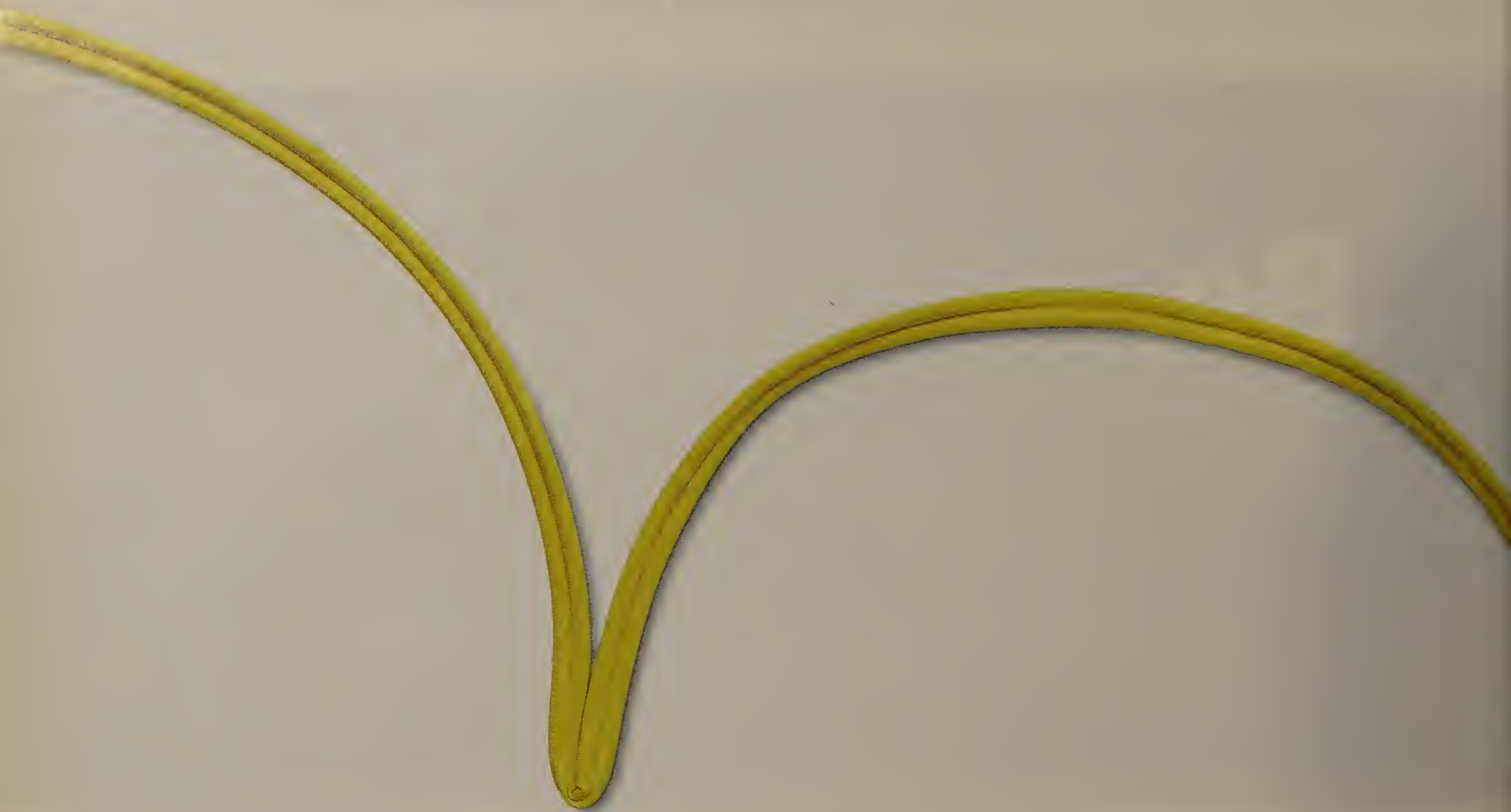


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Daniel Briere and Beth Gage

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- **Telezoo.com** lists products and services, helps you build and post RFPs, find integrators and telecom degree programs, post press releases, peruse directories of companies and look up acronyms. The elegance, breadth and depth of Telezoo.com's design are impressive. Plus, it's free and easy to use. Using its menus, you select products or services, then select a product type or a brand name. From there, Telezoo.com displays a list of comparable features. When you find the right service, Telezoo.com can launch an RFP on the spot.

- **Simplexity.com** provides an easy interface to select a type of service, compare service features among vendors and then purchase the product or build an RFP. Simplexity.com's format is very simple to use, although you must register to get full use of the site. The service is free, and Simplexity.com provides user anonymity to shield buyers from the advances of enthusiastic sellers.

- **TelecomSmart.com** and **CarrierChoice.com** have you create an account to ensure they can match you with the right products (and probably do a little marketing). Then a "reverse auction" takes place in which vendors bid for your service (in other words, they answer your RFP). While neither of these sites is as informative as Telezoo.com, they have similar information services in the works.

- **Databid.com** will launch this summer and says its "antiportal" approach will help make the experience of buying data services faster and less of a hassle. Databid.com will be a virtual sales agent and differ from its competitors by focusing exclusively on data services for small to midsize businesses with a complete end-to-end transactional experience and

online training tools.

- **Telcobuy.com**, an operations middleman, is the least impressive. To even kick the tires, you must register and get your credit checked. It allegedly has 500,000 products from more than 1,000 manufacturers. Unlike the other sites, which help you find a service, Telcobuy.com

handles order entry, provisioning, project management, single invoice and single point of contact.

The biggest downside to these sites is they require constantly updated information to really be helpful. That's a tough task, so be wary of outdated information. Still, it's a starting place. Let us

know if these are any help to you or not, so we can write more about them later.

*Briere is CEO and Gage is director at TeleChoice, a market strategy consultancy for the telecommunications industry. They can be reached at [wanmonitor@telechoice.com](mailto:wanmonitor@telechoice.com).*

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# Early adopters saving with voice over DSL

BY TIM GREENE

It's easy to see why James Knudson likes voice over DSL.

His Covina, Calif., law firm buys voice-over-DSL service from mPower Communications that supports four phones and Internet access on a 768K bit/sec DSL connection for about \$300 per month.

That's roughly what he paid just for individual phone lines, one of which he used dialing up his ISP.

Now the DSL service uses a single set of phone wires, and Knudson gets a faster Internet connection compared to the pokey 56K bit/sec modem access he used to buy.

"The way I look at it, I pay the same amount as I did before for the phones and get this DSL Internet access for nothing," Knudson says.

Knudson is the kind of customer voice-over-DSL service providers are looking for. He wants better Internet access and comparable phone service, and is willing to take a chance on this new technology in exchange for what he perceives as a bargain.

While upstart carriers are jumping on voice-over-DSL technology, established players are interested as well. SBC Communications has bet a \$6 billion network upgrade that provides voice over DSL to more than 80% of its customers. AT&T, which also wants to provide customers with multiple voice channels and broadband data access links, will use DSL to back up primary access technology cable modems.

Voice over DSL holds three other advantages. First, it streamlines services. Voice, data and Internet access travel over a single regular phone line and customers deal with one service provider.

Second, customers can order as few as one or as many as 14 voice channels on the DSL circuit. Carriers can easily supply customers with just a few channels, such as what Knudson buys. If customers want to add phones, service providers can add more voice channels without sending a technician to the customer site because the new connections can be turned on remotely over the same wires.

And third, such a package could potentially cost less than the same services bought separately from different providers and delivered over separate wires.

For instance, mPower offers a package of eight phone channels, up to 1.5M bit/sec Internet access,

## VOICE OVER DSL

***Voice over DSL is the first of many applications that will ride on DSL lines.***

1,000 minutes of long-distance, free local phone calls, 10 e-mail accounts and a Web page for \$400 to \$650 per month, depending on the city. Prices vary because the company sets the rates to slightly undercut the other local options, says Rolla Huff, CEO of mPower.

Later, when Knudson and other customers are satis-

tomers and feed it into a switch or router that peels off the packets carrying voice and diverts them to a voice gateway. The gateway transfers phone traffic to the traditional circuit-switched public telephone network.

This configuration could lead to even cheaper long-distance prices. Long-haul carriers today have to pay access charges to the regional Bell operating companies that account for three cents per minute of charges. Competitive carriers selling voice-over-DSL services don't have to charge those fees, so using voice-over-DSL access could mean lower charges.

At the same time, this configuration of hardware means carriers need to pair DSLAMs with ATM switches to sort voice from data traffic, and vendors are already making more complex gear that integrates the functions of separate equipment. For example, Accelerated Networks has integrated support for ATM

switched virtual circuits in its voice gateway, eliminating the need for an ATM access switch.

Start-up Integral Access has taken this a step further. Unlike DSLAM makers, Integral is not converting a DSL box into something else. Its PurePacket access device handles traditional voice and data, as well as DSL.

Three major makers of DSL voice gateways — CopperCom, Jetstream and Tollbridge — are also morphing their equipment. Jetstream this week at SuperComm 2000 will announce new features in its gateway, such as the ability to set up phone calls and interoperate with a softswitch, a new type of carrier voice equipment.

CopperCom says it also plans to announce a roadmap for how its gateway will change as telephone access networks evolve.

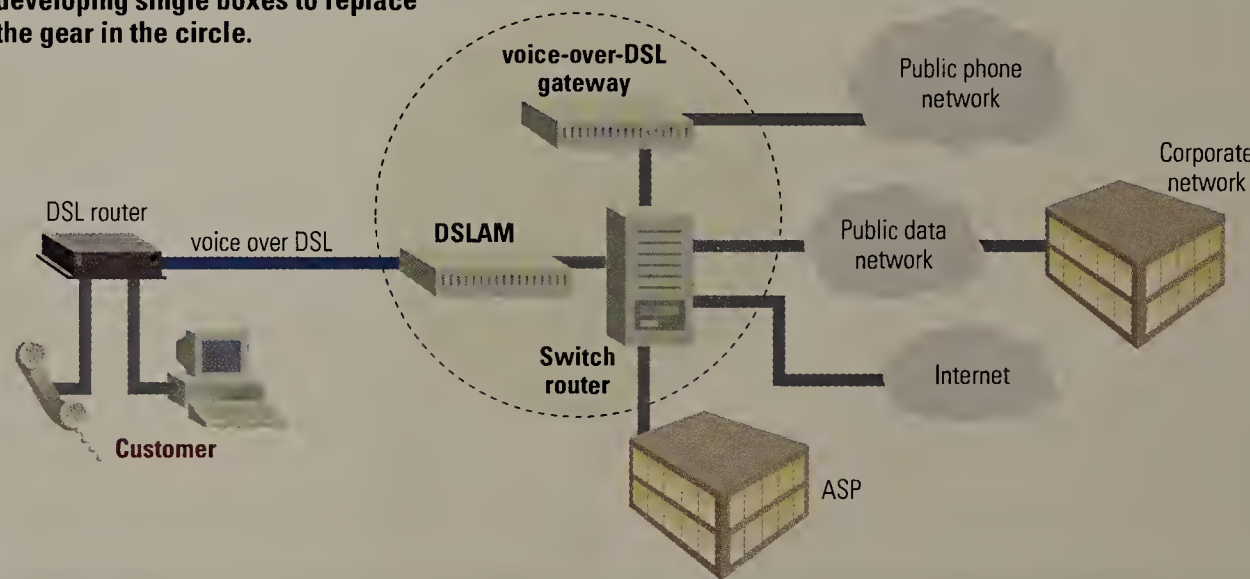
These new features are preparing for the day when long-haul networks are also based on packets, which will make delivery of phone service more efficient, says Ray Keneipp, an analyst with the Burton Group.

In the meantime, customers can look forward to voice, data and Internet-access packages from DSL suppliers, with a host of new services to come. Managed security and VPN services will emerge as customer premise equipment develops, says Erick Klein, an analyst with the Yankee Group in Boston. Voice over DSL will lose its prominence and become one piece of a larger set of options, he says.

"DSL is the distribution vehicle for multiple services, and [voice over DSL] will just be a part of that," Klein says. ■

## Voice over DSL is about to become streamlined

**First-generation voice over DSL requires multiple pieces of equipment in carrier switching offices to convert packetized voice to circuit-switched voice and forward it to the public phone network. Vendors are already developing single boxes to replace the gear in the circle.**



fied with these services, mPower will add to its service options. For example, mPower will offer access to applications such as payroll processing, Huff says.

This service roadmap follows the direction vendors are taking with the equipment that supports voice over DSL, which requires different equipment from traditional phone services. DSL lines become the access loop to the telephone network rather than regular, analog phone lines. DSL carries multiple voice channels as packets on a single circuit; traditional analog voice uses an entire circuit for each voice channel.

For voice over DSL to work, customer sites need to be equipped with gear that converts regular analog phone calls to ATM or IP. Such packetized voice uses some of the bandwidth on the DSL line to carry phone calls to and from customer locations.

At the carrier end of DSL lines, DSL Access Multiplexers (DSLAM) aggregate traffic from many cus-



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## Briefs

**Nortel Networks** has decided to brand ATM-based integrated access devices from Sonoma Systems under the trade name Universal Edge 600. Along with the OEM agreement, Nortel may take an equity position in Sonoma, based in Marina del Rey, Calif. The Nortel Universal Edge series will incorporate the Sonoma Integrator and Sonoma Access product lines, touted by Sonoma as delivering ATM-based toll-quality voice on a single access facility along with data and Internet traffic. Sonoma in turn recently acquired the patents of a Marlborough, Mass., company called Netphone that provides alternative PBX technology.

**Lucent** has signed an OEM agreement to offer Alteon WebSystems' 180e and ACEdirector 3 Web switches under the names WebDirector 80 and WebDirector 180, respectively. Used by service providers in conjunction with Lucent's WebCache replication appliance, Alteon's Web switches capture, parse and redirect traffic based on URLs and HTTP cookies. As a result, noncacheable traffic can be automatically bypassed from Lucent WebCaches, increasing performance. The package will be included in Lucent's IPWorX intelligent Web-content portfolio for service providers.

**Lucent's NetworkCare Professional Services** unit is teaming with **IBM Global Services** in what Lucent calls its CyberCarrier initiative. IBM will contribute data center planning, integration and tech support to Lucent NetworkCare's management of carrier networks. Lucent says the CyberCarrier category consists of service providers that offer underlying storage and transport to Web hosting and application service provider ventures.

## Intermediate bandwidth options emerge

*Tiara Networks employs a combination of Multilink PPP and Multilink Frame Relay.*

BY DAVID ROHDE

**SAN JOSE** — The large number of new local carriers and ISPs backed by venture capital or commercial real-estate interests face a daunting challenge when they knock on the door of enterprise network professionals.

Unlike the original big-city competitive local exchange carriers (CLEC), many of the new players haven't built out fiber networks to business locations and can't yet obtain enough copper-based DSL connections to serve a diverse base of branch offices.

That's why some start-up vendors of WAN aggregation devices are embracing a new frame relay standard that promises economical and flexible connections at intermediate speeds between T-1 and T-3.

These vendors are offering carrier-class boxes running Multilink Frame Relay (MFR) — often paired with integrated access devices for the customer premises — to service providers targeting midsize business locations or multi-tenant buildings.

For example, Tiara Networks in San Jose, which came onto the service

### Cutting costs down to size

Here is a comparison of the total cost of multimegabit access equipment for a combined customer premises and service-provider POP, assuming seven enterprise users are each consuming four T-1s of bandwidth (or 6M bit/sec):

Bit-based inverse muxing*	\$235,000
Load balancing:	\$164,700
Inverse Multiplexing over ATM (IMA):	\$140,000
Multilink Frame Relay:	\$112,000
Multilink PPP:	\$89,500

\* The cost of bit-based inverse muxing rises largely because it requires seven HSSI modules for the carrier's frame relay/ATM switch.

provider equipment scene last year offering ISPs access concentrators supporting Multilink PPP, recently introduced the Tiara 7000 Frame Switch running MFR. Tiara is offering CLECs, "building LECs"

and ISPs the 7000, which aggregates up to 128 user connections at DS-0, NxDS-0, T-1 or up to eight times T-1 lines.

Tiara says that MFR — an implementation agreement ratified by the Frame Relay Forum in October — can save service providers 25% or more when compared with more traditional T-3 ATM-based access concentration at central offices. The company says MFR can also relieve customers of the dilemma of making the jump from a T-1 frame relay or T-1 Internet access connection to T-3 ATM service or a straight 45M bit/sec line.

The space between T-1 and T-3 is "kind of a yawning gap in the spectrum of available services," says Bill Flanagan, an analyst with The Burton Group in Sterling, Va. New products such as the Tiara 7000 are going to help service providers "who are taking the position that they are going to do broadband and yet don't have any infrastructure or the money to run fiber to every customer," Flanagan says.

In addition to the Tiara 7000, which is priced at just less than \$20,000, Tiara has introduced the Model 1450 multimegabit access concentrator for the customer

See **Tiara**, page 50

## Cabletron spinoff aims for next-generation carriers

BY PHIL HOCHMUTH

**SANTA CLARA** — Riverstone is the MAN.

That's one thought Riverstone CEO Romulus Pereira would like metropolitan-area network service providers to have when choosing their data communications platform.

Pereira says Riverstone is using Gigabit Ethernet and 10-Gigabit Ethernet to supercharge the MAN backbone, while still offering next-generation service providers the choice of other transport options such as ATM.

"The previous generation of metro spaces had service problems in terms of infrastructure bandwidth and the ability to deliver rich content and very bandwidth-hungry content," Pereira says.

With more last-mile fiber being laid and national 'Net core backbones coming online, the bandwidth bottleneck is shift-

ing to the space "in the middle of the sandwich" where the demand for hosting and content services is emerging at a rapid rate, he says.

Riverstone is marketing its line of RS 2000 and RS 8000 switch routers and the RS 32000 with up to 240 Gigabit Ethernet ports to competitive local exchange carriers and others that offer converged services to the MAN.

Each switch provides multiple WAN interfaces, including 10-Gigabit and Gigabit Ethernet, ATM, packet over SONET/ SDH, ATM, T-1 and T-3/E-3 interfaces, giving service providers several ways to deliver services to customers.

However, Pereira says the key to the MAN will be the ability to sell and manage bandwidth between customer premises that emulate dedicated lines via switched Gigabit Ethernet.

"If I'm a customer in the metro area and I happen to be in multiple buildings, it would be nice if my service provider could offer me guaranteed bandwidth with security" throughout the network, Pereira says.

Because Riverstone's boxes "slice and dice bandwidth in different ways," they give service providers "the ability to create the next-generation transparent LAN services, making the metro landscape look like a set of dedicated, point-to-point leased lines."

Pereira also wants to make Riverstone the end-to-end platform for application service providers (ASP) "in the basement [of customer buildings], in the hosting center and in the infrastructure in

See **Riverstone**, page 50



Riverstone's Pereira sees bandwidth bottleneck "in the middle."



Tiara,  
continued from page 49

premises or common area of a multi-tenant location. It has eight T-1 interfaces for symmetric multimegabit access up to 12M bit/sec and includes DSU/CSU functionality. The unit con-

nnects to an existing router or similar device through a single HSSI port, and is initially priced at just under \$10,000.

Tiara has also added MFR support to its existing premises-based devices that offer four to eight T-1s for Multilink PPP. Each can provide more bandwidth efficiency than ATM-based access-concen-

tration schemes. Certain kinds of transaction processing applications, which pare down to 64-byte packets, aren't efficiently shoehorned into 53-byte ATM cells, Flanagan says.

And if routers chop Ethernet packets down to 256 bytes, "You end up with a partially filled cell at the end. That's how

the cell tax goes up," Flanagan says.

MFR is not for everybody, he says. Many enterprise data centers have been moving from T-1 frame relay to T-3 ATM without having to alter their branch offices' frame relay links because large carriers now generally use standards-based frame relay-to-ATM interworking. In addition, each of the Tiara 7000

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- Are next-generation "Packet PBXs" ready for integration into your network?

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boxes can support a maximum of 128 user connections. That's not a problem if each user orders a T-1, but potentially it presents a provisioning challenge if many 56K or 64K bit/sec frame relay or Internet links are mixed in.

The limitation is in the physical-layer controllers, says Kash Mitra, Tiara's vice president of marketing. The company is awaiting higher-density chipsets from PMC-Sierra to build up the scalability of the aggregation device. But Mitra adds that the current configuration is ideal for many ISPs.

Still, newer service providers that have to use multiple carriers to back-haul traffic to their POPs will face a marketing challenge. "I don't know how you tell [users] you're getting T-1s from different carriers," Flanagan says. "They should sell it as diverse routing." ■

Riverstone,  
continued from page 49

between." The RS switch line can provide the traffic-shaping capabilities required to deliver bandwidth to applications ASPs lease out, he adds.

Ron Westfall, an analyst with IT research firm Current Analysis, says Riverstone's future in the MAN market could be bright, but some issues need to be addressed. Riverstone "still has to prove it can operate independently from the Cabletron corporate infrastructure," he says.

Westfall says Riverstone must partner with companies that sell to the 'Net core and sell products that content service providers such as ASPs utilize. ■

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*Fig 2. Ditto*

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## Briefs

**Aprisma Management Technologies** of Durham, N.H., and **BMC Software** of Houston last week jointly announced a software module that will let companies view network and application management data from the same console.

The module, which runs on Windows NT or Solaris, sits on the same server as Aprisma's Spectrum 6.0 network management package. It lets companies combine data collected by Spectrum and BMC's Patrol 2000, which tracks the performance of databases, operating systems and assorted applications. Data can be viewed from a Spectrum or Patrol 2000 console. The module will be available next month for \$5,000.

Aprisma: [www.aprisma.com](http://www.aprisma.com)

**NetIQ** of Santa Clara, which makes software to test and monitor Windows NT/2000 networks, has announced product enhancements designed to help IS staffs deploying Microsoft applications.

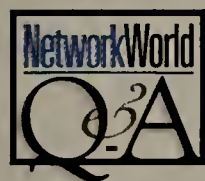
The company says its Chariot network performance analysis software will now predict how introducing Microsoft's Active Directory and Exchange 2000 software will affect network bandwidth.

Additionally, the company's Pegasus IP and SNA network monitoring software will now do real-time monitoring of Active Directory and Exchange 2000 for application optimization. NetIQ acquired the two products with its recent buyout of Ganymede Software.

Chariot and Pegasus support for Active Directory and Exchange 2000 is available now. Chariot runs on Windows NT/2000, and Pegasus runs on NT. Chariot costs \$14,000; Pegasus costs \$25,000.

NetIQ: [www.netiq.com](http://www.netiq.com)

## Critical Path: E-mail outsourcing plus



*David Thatcher, president of messaging services company Critical Path, spoke recently with*

*Network World Senior Editor Carolyn Duffy Marsan about the company's recent acquisition binge, its plans regarding wireless messaging and what IT executives worry about when they outsource their e-mail systems.*

**Last year was a busy one for Critical Path. The company went public and then went on an acquisition binge, buying eight messaging vendors since last June. What is the status of the company?**

Over the last year, we did two public offerings. We followed the most recent with a convertible debt financing, which leaves Critical Path financially sound. We also did eight acquisitions over that period of time, and those acquisitions were all very small. What it leaves us with now is the full complement of messaging applications sitting on top of the basic e-mail engine. That e-mail engine can either be in the form of software that the customer maintains or it can be in the form of outsourcing.

PROFILE:  
CRITICAL PATH

<b>Headquarters:</b>	San Francisco
<b>Founded:</b>	1997
<b>Product:</b>	Outsourced messaging services and software.
<b>Mailboxes provided:</b>	100 million
<b>Financials:</b>	IPO in March 1999; secondary public offering in June 1999; convertible debt financing in spring 2000.
<b>Key executives:</b>	Douglas Hickey, CEO; David Thatcher, president
<b>Fun fact:</b>	Critical Path has acquired eight companies since June 1999, including ISOCOR and RemarQ Communities.
<b>Web site:</b>	<a href="http://www.cp.net">www.cp.net</a>

**What progress have you made in assimilating all the companies you've acquired?**

We consider all of the companies to be completely assimilated — not only from a cultural viewpoint, but from a personnel, and most importantly, a technological viewpoint.

**What were the most difficult challenges that you faced in assimilating all of those companies?**

The biggest challenge was assimilating the people. We adopted the Cisco methodology and have been pretty successful. We have an integration team within Critical Path that goes out and identifies the culture, identifies the people that are strong. And we are able to very quickly assimilate those people within Critical Path as a result.

**Will you make other acquisitions this year?**

If the opportunity is there at the right price with the right people and, most importantly, with the right technology. We facilitated the acquisition process by doing the convertible debt offering, which cleared another \$300 million in cash in the Critical Path bank account. I look at the acquisition environment as being opportune now as a result of the stock market [decline] and the ability of companies to go out and raise financing through public means being shut off. Critical Path's stock is not down nearly as much as some other Internet companies'. So we have a good currency, and the market is ripe from a valuation standpoint.

**What types of companies might you acquire?**

Critical Path is keeping a tight focus on messaging, so anything within the messaging arena is something we could look at for either an acquisition or a strong partnership [like] content security or secure storage. You could see us looking at business-to-business instant messaging or other wireless applications.

**What is your strategy for wireless messaging?**

See **Critical Path**, page 56

## BindView smooths way to Win 2000

*One new tool focuses on migration to Active Directory.*

BY JOHN FONTANA

**HOUSTON** — Now that its acquisition of former rival Entevo is completed, BindView is again focusing its efforts on tools to help IT executives cut through the clutter of migrating to Windows 2000 and Active Directory.

This week, the company will unveil two products for its line of "bv" management and migration tools. With bv-Control for Active Directory 1.0, the company is drawing on its proven success with similar tools for managing NetWare and Windows NT environments to bring security and configura-

tion reporting capabilities to Active Directory.

Also, the company is releasing bv-Admin for Win 2000 Migration 3.5, an Entevo product BindView is putting under its "bv" banner. The tool helps corporations clean up and consolidate their NT domains for the move to Win 2000.

BindView, FastLane Technologies, NetIQ and Aelita are all rushing to meet the needs of customers moving to Active Directory.

"These products are all similar and you have to get to the details to find out See **BindView**, page 56

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SECURING THE  
FUTURE

Critical Path President David Thatcher says messaging security is an important opportunity for the company. Find out more in "Secure e-mail messaging: A foundation for e-business."





# Java package aims to simplify Web interactions

Version 2.0 of Savvion Business Manager lets companies consolidate multiple business processes into one.

BY JOHN COX

**SANTA CLARA** — The latest edition of a Java-based software package is designed to take much of the complexity out of doing business over the Web.

Savvion Business Manager 2.0, from Savvion, can be used to set up, run and manage business interactions such as checking the status of a shipment of chemicals, confirming a manufacturing schedule or quoting a price on a customer order.

Version 2.0, which consists of Java server programs and Web-based graphical tools, boasts 50 new features, most of them suggested by Savvion's customers. One key change lets users pull together into a single interaction what had previously been several separate events or actions.

One customer, says Savvion founder and Chairman Mohammad Ketabchi, used the

## PROFILE: SAVVION

**Headquarters:** Santa Clara

**Founded:** 1994

**Primary business:** Server software and tools that let companies define complex business processes, such as a request for quotation, then generate the XML and HTML documents so the process can be executed by users with Web browsers.

**Employees:** 170

**Fun fact:** In the first four months of 2000, the company reaped \$25 million in venture funding, including investments by Trans Cosmos USA, D-Age and Redwood Venture Partners.

software to set up a Web-based "request for quotation" process, which can have up to 200 steps and numerous points at which decisions can, or must, be made.

Savvion's server programs can run on an array of operating systems and use XML to share information. Any XML client can work with these programs.

One piece of Savvion Business Manager 2.0 lets a developer map out the sequence of steps, the data needed and the rules overseeing a specific interaction. Then the program creates an application — a set of XML documents and HTML screens, which are controlled by another part of the Savvion package. Still another program

within Version 2.0 lets users administer all interactions: collecting data about them and changing them, if necessary.

Still other programs, called BizAdapters, can be used to read or update data in enterprise applications, such as SAP AG's R/3 suite, and databases.

Savvion's software can identify whether the Web clients are PC-based, on handheld personal digital assistants or on cell phones. The software then tailors the display and graphical user interface interactions to match the client device's capabilities.

The first edition of the software was released in December by Technology Deploy-

ment International in Santa Clara. Since then, the company has rounded up \$25 million or more in venture capital and this week, at the JavaOne conference, will reintroduce itself as Savvion. The company will also start a new marketing push to expand its list of blue chip corporate customers, which include Cisco, IBM and Philips.

Savvion Business Manager 2.0 pricing is based on "power units," a measure of a CPU's processing power, and the operating system. A typical, small-scale distributed Savvion application will cost about \$75,000 to deploy.

Savvion: [www.savvion.com](http://www.savvion.com)

## IBM, SAS bolster B2B exchanges

BY STEPHEN LAWSON AND CLARE HANEY

Ariba, and will begin operating in July.

IBM, i2 Technologies and Ariba in March announced a broad alliance that includes integration of some of their business-to-business technology, joint marketing and sales, and an equity investment from IBM in both e-commerce companies. With that agreement IBM said it would integrate i2's TradeMatrix marketplace software and the Ariba B2B e-commerce platform with its own software, including WebSphere, WebSphere Commerce Suite, DB2 and MQSeries. The resulting business-to-business offering will be used to serve the customers of IBM's \$45 billion e-procurement business.

Over at SAS, the firm announced a first for the privately owned company — the spinoff of a business-to-business Internet operation.

The new spinoff, which is to be known as iBiomatrix, will become a wholly owned subsidiary of SAS and will concentrate on biomedical research, SAS said in a statement. The subsidiary will use Internet portals to facilitate the exchange of data between life sciences researchers, par-

See **Exchanges**, page 56

## Microsoft gets good news in Sun suit

BY JAMES NICCOLAI

Microsoft may be against the ropes in its antitrust battle with the U.S. government, but it can take some solace in a preliminary ruling that could save it \$35 million in its legal war with Sun over Java.

A U.S. District Court judge last week tentatively dismissed Sun's claim that Microsoft posted portions of Sun's Java source code on its Web site in violation of its Java licensing contract. Under terms of the contract, any company that commits such a violation would be required to pay Sun \$35 million in liquidated damages.

Judge Ronald Whyte tentatively granted a motion filed by Microsoft to dismiss Sun's claim, saying that it's not clear yet whether Microsoft posted the code intentionally and with the knowledge of senior managers, or whether the code was generally available to the public. He invited the companies to

argue the matter further at a hearing set for Aug. 11.

"It's a tentative order, which means it's not binding," says Sun spokeswoman Penny Bruce. "Tentative orders are designed to help focus oral arguments on specific questions articulated by the court, so it will help focus our oral arguments on Aug. 11."

Microsoft's motion to dismiss Sun's claim is just one element of a broader lawsuit that has kept the companies at loggerheads for more than three years. Sun filed its lawsuit against Microsoft in November 1997, accusing the company of illegally using an "impure" version of Java in its products that works best with its own Windows software. Microsoft denies the charges and has countersued Sun.

While pretrial hearings have been under way, no date for an actual trial has been set. The case is being heard in the U.S. District Court for the Northern

District of California in San Jose.

In a separate order issued last week, Whyte designated Aug. 11 as the date for a hearing on all outstanding summary judgment motions in the case. He pegged the same date for a case management conference at which a date for the trial will be set, along with a date when each side will have to disclose its expert witnesses for the trial.

Microsoft's alleged violation of its Java licensing contract was cited by government attorneys during the antitrust trial as evidence of anticompetitive behavior.

*Niccolai is a senior editor at IDG News Service in San Francisco.*

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**Critical Path,**  
continued from page 53

Our whole messaging offering is just as applicable to the wireless environment as it is to the LAN or the PC environments.

Many [people] predict there will be twice as many wireless handsets that are Internet-capable by the year 2003 as there are PCs that are Internet-capable.

Because of speed and screen limitations [of wireless devices], much of the information available over the Internet will come in the

that you run into in the enterprise is Microsoft Exchange. But because Microsoft Exchange is becoming so complicated and expensive to run, even Microsoft is looking at ways to outsource or host that technology.

So what we're selling to the enterprise is hosted Microsoft Exchange or our hosted solution. Currently, it costs between \$12 and \$14 per corporate user on a monthly basis to handle their e-mail. Critical Path's solution ranges from \$4 to \$5 per mailbox, per month. And with that you get the ability to

larger and larger companies adopting outsourcing, especially those that have [dispersed] geographical locations or those that have multiple e-mail systems within their enterprise because of acquisitions.

The best example is our partnership with Federal Express, whereby FedEx is outsourcing some 3,000 mailboxes and hopefully soon it will spread throughout their organization. They're buying Web-mail, and they will be looking at security and potentially calendaring. We also have a large outsourcing deal with Sun.

**When you talk to chief information officers or CEOs of large companies here in the U.S., what issues are they most concerned about regarding their messaging systems?**

People are still interested in basic e-mail messaging. Security is second. I think people are looking at how they can have more dependability and reliability and the ability to have a key business mechanism function better.

**What will Critical Path look like a year from now?**

You will see more and more offerings, either through partnerships or through acquisitions. Cur-



rently, [analysts] have us in 2001 as being at \$240 million in revenue. And that's off a \$900,000 revenue year in 1998. So it's pretty phenomenal growth.

**What are the top three opportunities for Critical Path in the enterprise market this year?**

The basic e-mail engine is very hot right now and represents a huge opportunity for Critical Path. Beyond that, I think it's secure messaging and collaborative tools. And I would say that directory services will be very large this year.

**What are your plans with regard to secure messaging?**

It's a huge market, and it's a market that not only applies

to the desktop but also to the wireless environment. The way Critical Path has approached this is through the ubiquity of the Internet. We can act as a certificate authority . . . so that both sides have the utmost level of security.

Not only that, but it's a Web-based methodology such that there is never any software download requirement. The companies that are most interested are in the financial services industry, the legal industry, the accounting industry—anyone that is transferring documents.

**What is your strategy with regard to unified messaging? I'm defining unified messaging as integrated voice, e-mail and fax.**

We have unified e-mail and fax and have several partnerships, for instance with Comverse and Mavio and others in Europe for the voice component. Unified messaging the way you define it really requires a wireless component.

In the United States, the main wireless device is a pager so there's no voice component to that. In Europe and Japan, it's a different story. Therein lie our relationships with both Comverse and Mavio.

For instance, Mavio is a small private company in London that we believe has a great unified messaging solution. We've fully integrated Mavio into our solution. That will be rolled out in the next month. ■

**"We will start seeing larger and larger companies adopting outsourcing, especially those that have [dispersed] geographical locations or those that have multiple e-mail systems within their enterprise because of acquisitions."**

way of messaging. So that just represents one more opportunity for Critical Path.

**What trends are you seeing in the enterprise messaging market?**

The biggest competition

have updated software all of the time, greater reliability and at a much cheaper cost.

**Is this the year when large companies are ready to outsource their messaging?**

Yes. We will start seeing

**BindView,**  
continued from page 53

what is best for any given enterprise," says Phillip Mendoza, an analyst with IDC, a market research firm in Framingham, Mass. "The good thing with BindView is that they have migration and strong reporting products that go hand in hand and can be managed from a single console."

For Active Directory, BindView has developed query-based reporting tools for tracking the progress of migrations and gauging their success.

What bv-Control for Active Directory does is treat the directory like a database, allowing users to run queries. A key feature is its Policy Assessment tool, which can check security policies on files, groups and containers. For example, an assessment can be run on a single file

within the directory to discover every user who has access to that file.

The collection of tools also provides checks for adherence to security configuration policies once the migration is complete.

However, the package focuses more on reporting than analysis, an imbalance BindView will address in the next release of the product.

"What we're doing is making it easy to ask questions about your environment," says Dan Hurley, BindView's segment manager for platforms and directories. "The focus is to reduce risks."

With bv-Admin for Win 2000 Migration 3.5, BindView is repackaging Entevo's Direct Migrate.

The tool lets users restructure and consolidate NT domains, find and delete inactive groups and users, develop migration project plans and roll back changes if prob-

lems occur. In addition, the tool can be used to transfer directory test models created in NT directly into Active Directory.

The tool also has a Web-based account activation component that lets end users activate and check the accuracy of their own accounts once they are

moved to Active Directory.

The price of bv-Admin for Win 2000 Migration 3.5 is \$9.95 per user, while bv-Control for Active Directory is \$17.95 per user. Both products are scheduled to be available later this month.

BindView: [www.bindview.com](http://www.bindview.com)

## New at BindView

**BindView is adding two new applications to its line of migration and management tools. Here are some highlights of each product:**

### **bv-Control for Active Directory**

- Reporting and analysis tools for verifying migration/project status and assessing security compliance.
- Built using native Active Directory services interfaces.

### **bv-Control for Win 2000 Migration 3.5**

- Uses Microsoft Exchange data to create accounts and permissions in Windows 2000.
- Automated cleanup of Secure-ID history tables.

**Exchanges,**  
continued from page 54

ticularly in relation to the safety and effectiveness of drugs and medical devices.

One of the new spin-off's divisions will be the SAS PharmaHealth Technologies business unit. Parent company SAS will give iBiomatrix access to SAS data warehousing and decision support software and the research and development supporting those products.


*Lawson and Haney are correspondents with the IDG News Service.*



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'Net Insider . Scott Bradner

## SAY WHAT YOU MEAN AND MEAN WHAT YOU SAY

I have pushed quite hard for the U.S. government to pass some meaningful laws to protect the privacy of Internet users. Some readers have chal-

lenged me to describe any laws that could do anything useful. I'll give it a try. I think there are three principles:

- Tell me clearly what you are going

to do with my data.

- Don't change your mind.
- Don't use data from other sources without my consent.

There are certainly problems with a local government, such as that of the U.S., defining laws to regulate the very international Internet, but the U.S. government can regulate how U.S. companies obtain and use information.

The government can do both of these things, but I'm not sure it should do the latter. I don't think it's productive for any government to say what information can be used in what ways because of the speed of change in the Internet landscape. But I do think that some basic laws would help a lot.

Law No. 1: Every Web site that collects any information about visitors must have an easy-to-locate privacy policy that must say in plain English what data is collected and what purposes the data is going to be used for. This policy must cover any third party (such as DoubleClick or Akamai) that is in a position to collect information about Internet visitors.

Law No. 2: The Web site's policies cannot be changed to invade privacy in any additional way without clear notice and without discarding all information obtained under the previous policy. A site should have the option to ask individual users for their permission to retain the information about them, but must not retain information without specific individual approvals.

Law No. 3: No company doing business in the U.S. may use any data from Web sites that was not collected following the restrictions in the above laws.

Basically, individuals should be able to decide for themselves what level of privacy they are willing to give up. And they should be able to be sure that the companies, at least the U.S. ones that they are dealing with, will not lie to them. The European sites are already under far stricter rules than I ever expect to see here. The penalties for companies violating these laws should be significant.

For example, failing to post a privacy policy or posting a false one should mean a fine of \$1,000 or 10 days revenue of the Web site, whichever is higher, for every day of violation. Making use of improperly collected data should be a felony for anyone making the decision to do so and result in a very large fine for the company.

Some observers claim the Federal Communications Commission already has the needed laws, but empirical evidence shows this not to be the case. Let's get this problem behind us once and for all.

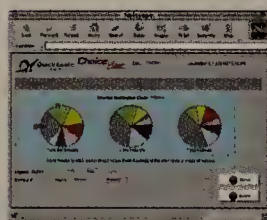
Disclaimer: Empirically, Harvard's reputation is subjective, but the university has not expressed an opinion on Web privacy. Thus, the above laws are my suggestion.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at [sob@sobco.com](mailto:sob@sobco.com).

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# Technology Update

An Inside Look at the Technologies  
and Standards Shaping Your Network

## Ask Dr. Intranet

By Steve  
Blass

With all the  
new e-mail  
viruses going  
around (Melissa,  
ILOVEYOU, etc.),  
how do you protect  
yourself?

First, I have the luxury of being able to log on to our mail server and preview my e-mail on the Unix server. Microsoft macro viruses won't do any harm there. This lets me weed out a large amount of mail that I don't need to download. Second, I don't use Microsoft mail clients. Third, I don't open attachments unless I absolutely have to. E-mail attachments are a carrier's dream and a working man's nightmare. Do you realize how big a one-paragraph note becomes when you put it into a word processing program attachment? For example, this column is more than 20 times larger as a Word document than as an ASCII text file. I don't have time to mess around launching applications to read attachments I don't care about. Unless I know the sender and I know that I care about what they sent me in the attachment, I don't open attachments.

Even so, I have occasionally messed up. At that point there are two more lines of defense: I keep the important stuff backed up, and I keep my virus software current. The last virus that almost got me came in a PowerPoint attachment that tried to hide itself from Windows. McAfee identified the virus as uncleanable and locked my machine. I powered down, booted up Linux and erased the file.

Blass is a network architect at Sprint Paranet in Houston. He can be reached at [dr.intranet@paranet.com](mailto:dr.intranet@paranet.com).

## Server-side caches speed e-comm sites

BY GREG GOVATOS

Nothing can tarnish a Web site's reputation as quickly as poor performance. Research shows that if a page doesn't load in eight seconds or less, visitors will exit and probably not return. For a site that wants to turn those visitors into customers, the effect of poor performance can be measured in lost sales.

In fact, Zona Research estimates that more than \$4 billion in e-commerce sales are lost each year in the U.S. because of slow page-loading times.

The delivery of a single Web page requires continuous TCP handshaking and multiple round-trip HTTP transfers between browser and server. Plus, as the Internet has grown, these transmissions are being performed across more network hops. The average Internet transaction must now make 19 network hops, according to research firm Jupiter Communications.

More bandwidth and more powerful servers don't solve these fundamental structural issues. The only way to make a dramatic impact on sluggish response is to circumvent the Internet's inherent inefficiencies.

This is where caching comes in. Caches locally store and deliver frequently requested Web objects, eliminating the need to traverse the Internet to move data back and forth. In doing so, caches speed page-loading times and conserve upstream bandwidth, creating an improved online experience over a more efficient network.

To ensure that data stored in a cache is up-to-date and accurate, a cache will perform freshness checks with the source server. The approaches to achieving freshness vary, but more advanced solutions will perform these checks intelligently and in the background to ensure that response times are not compromised.

Caches have been historically deployed at the network edge in close proximity to users — in points of presence, for example — to maximize performance and bandwidth benefits.

A relatively new but high-payoff application of caching is server-side within e-commerce and online content sites. To ensure that they don't violate the "eight-second rule," these sites are constantly seeking ways to boost their

infrastructure. Adding more Web and application servers is the most common approach, although this is expensive and difficult to manage. As an alternative to "server creep," forward-looking sites have deployed caching.

Within an e-commerce or content site, the goal is to accelerate a finite set of data outward to a large number of users, improving performance. In these environments, caches are deployed in front of the server farm, thus they are called server-side caches.

Server-side caches handle all

dle other tasks and optimizing the entire infrastructure.

Among the benefits of server-side caching:

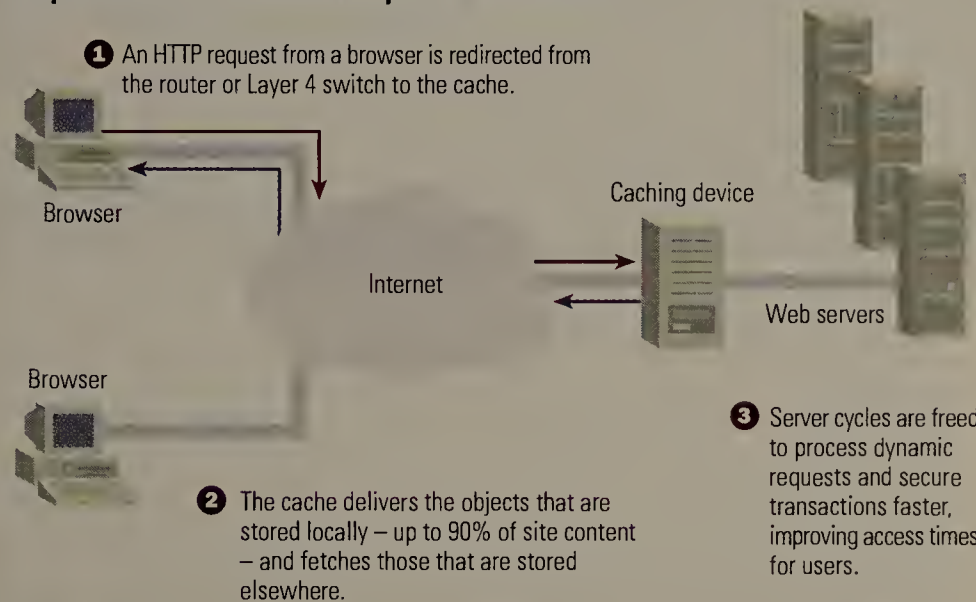
- Response times improve 50% to 80%. Sites that delivered 10-second response times can now deliver pages in two to five seconds.

- Sites can service two to three times the volume of hits with the existing infrastructure. And peak events, generated by sales promotions or highly visible content, can be handled gracefully.

## HOW IT WORKS

### Caching takes heat off back-end servers

Used more and more frequently on e-commerce Web sites, caches locally store and deliver frequently accessed objects, which greatly reduces the number of network hops that need to be made to deliver data. Caches accelerate page-loading response times and conserve upstream bandwidth.



HTTP traffic, effectively shielding the servers from these routine requests. Incoming HTTP packets are redirected from a router or Layer 4 switch to the cache. The cache instantly delivers those objects that are stored locally and fetches those that are held elsewhere.

Because the content that is being managed by the cache is "contained" to a particular site, the cache can hold most objects in its main memory for fastest possible retrieval and can deliver very high hit rates — exceeding 90%. This means that more than 90% of requests are offloaded from downstream networks and servers, freeing those resources to han-

- Not only are more customers viewing more pages and making more transactions, but the site's capital and operating costs are lower. Caching limits the number of servers that are required to handle a given load. Plus, caches are easier to install and maintain than servers with complex operating systems.

The ultimate benefit for a site, of course, comes from satisfied visitors and customers who generate ad impressions and online transactions.

Govatos is director of marketing at CacheFlow in Sunnyvale, Calif. He can be reached at [greg.govatos@cacheflow.com](mailto:greg.govatos@cacheflow.com).





Gearhead — inside the network machine . Mark Gibbs

## MANGLED MASS STORAGE

Last week Gearhead delved into the convoluted world of the SCSI. What fun it was! With that whole realm of technology still fresh in our

minds, let's discuss what to do when your disk drive seems to have joined the choir invisible, to be pushing up the daisies or to be an ex-disk drive.

Gearhead will skip the extremely obvious comments on the need for backups, as a) we all know about backups, b) the need for backups has been

part of every article we have ever read on PCs and every seminar we have ever attended, and c) we don't do no stinkin' backups around here so don't mention the topic because it is embarrassing and irritating.

So, there are three scenarios to consider: Case 1 — dead drive, as in no whirring or anything normal; Case 2 — normal drive noises with or without flashing lights, but no data access joy to be found (and without obvious error messages like "Bad sector found"); Case 3 — abnormal nasty noises with or without access to the data and error messages.

In the first two cases, check the disk drive cables. We know it's a stupid, dumb thing to suggest, but check 'em anyway. They could have been put on poorly when the system was built and been jarred loose when you turned the box around to connect that printer to the parallel port. If it is a SCSI-based system, make sure the terminators are in place, as they can come loose too.

If the cables are, to use a Woosterism, tickety-boo, then in the first case the drive may be truly dead. We'll come back to that later because it is where real drama creeps in.

In the second case, you may have a corrupted CMOS RAM. You'll need to access the CMOS setup (usually by hitting F2 or similar during boot up) and check that the drive configuration is correct. You don't know what the CMOS setup should be? Check the manual that came with the system.

No manual? Ah, small problem. Nope, actually, big problem. May we suggest keeping a copy in the future? There's a dozen good tools for this, including the venerable Norton Utilities.

Failing authoritative information, you can always examine the drive and find its specifications either on the drive, the vendor's Web site or from one of the many books on the subject (as Gearhead mentioned last week, *PC Hardware Library Volume 1* by Scott Mueller is an invaluable reference).

Once you have its details (typically the number of physical and logical heads, sectors and cylinders) then you can go and plug that data in to the CMOS disk drive setup and pray.

So, let's say that your CMOS isn't corrupt and that the drive won't give up its data. If the error message says something like "What the hell is this," then assume that your disk is in the process of self destructing. It may only be a bad sector, but as your PC is complaining in an unusual way, the problem may be in the more important areas of the disk surface such as the file allocation table or the master boot record.

Next week, we carry on with dead and dying drives. Till then, normal access at [gb@gibbs.com](mailto:gb@gibbs.com).

# Spine-tingling suspense...

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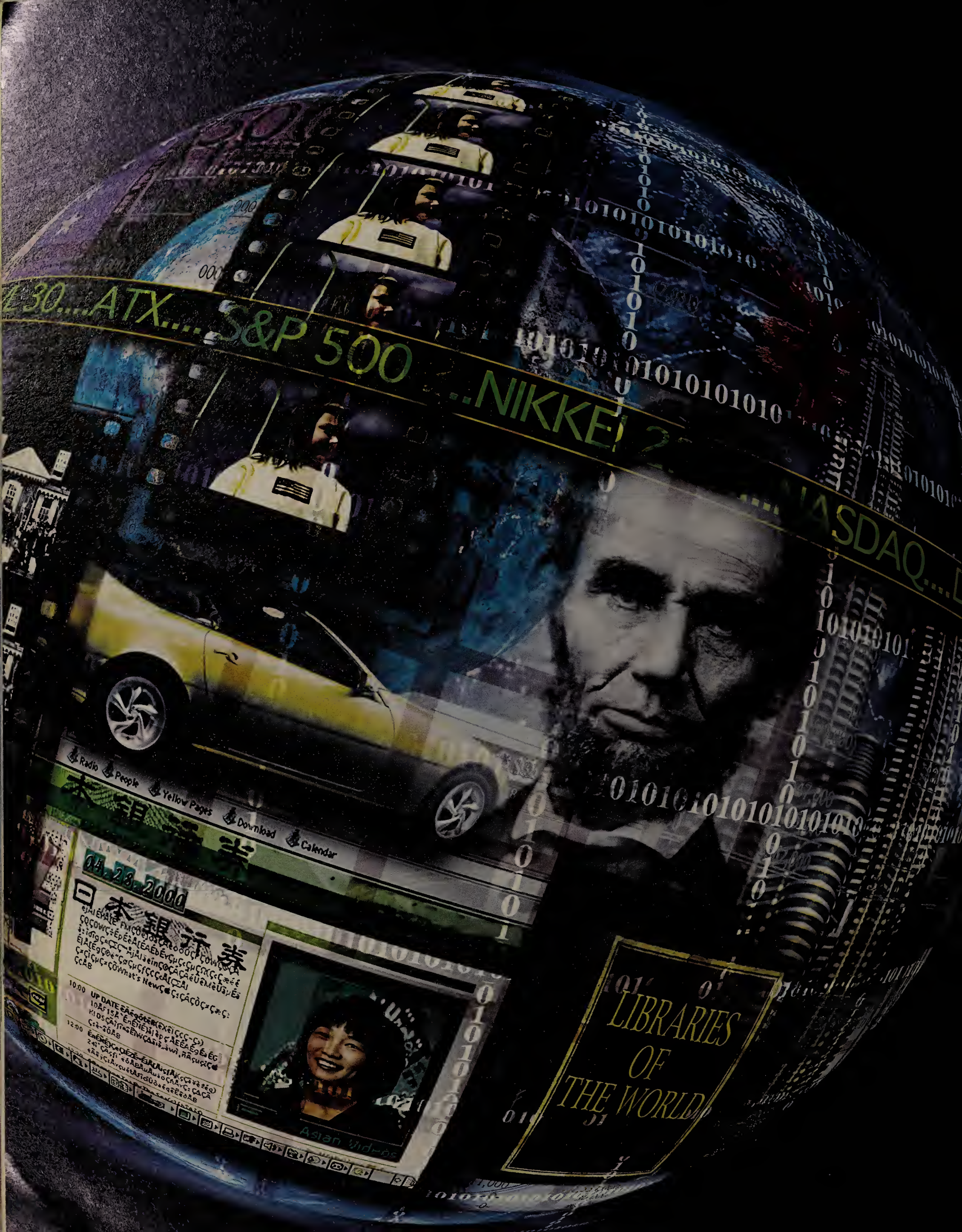


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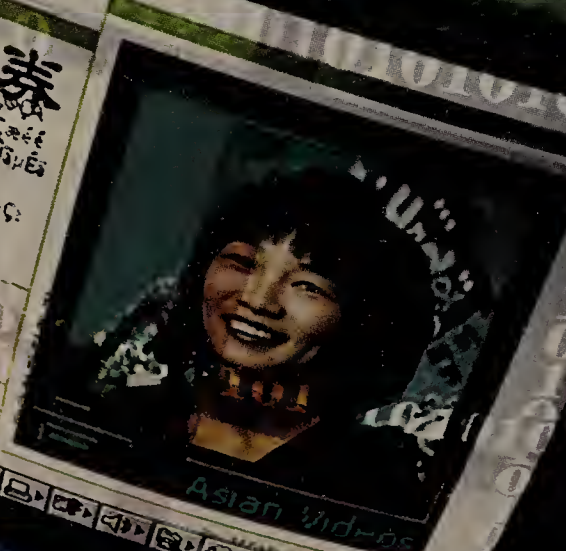
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## Editorial

### Spit out of the Vortex

The invitation-only Vortex 2000 conference two weeks ago drew the usual elite collection of vendor CEOs and industry shakers, everyone from Qwest's Joe Nacchio to UUNET's John Sidgmore to Federal Communications Commission Chairman William Kennard.

This is a vendor/venture capitalist/consultant event hosted by IDG, the publisher of *Network World*, in which industry hot-shots discuss the future. The technologies mentioned most often? Wireless and optics. No surprise there.

There were also a few small firms with new wares, two of which caught my eye.

One was Kerbango, which showed an Internet radio that looks like a standard desktop radio but has a small screen instead of a dial because it can receive content from any-

where in the world. As the selection is so large, the first thing you do is scan for stations based on music categories. The device then lists all the available sources in the category. You make your selection and the content is streamed to you.

Once DSL and cable modems become pervasive and people start outfitting their homes with power line or wireless networks, they'll be able to put the radios in their homes and tune in the music they want from anywhere in the world. The technology will likely be found in everything from clock radios to stereos. It promises to play havoc with traditional radio demographics and perhaps reshape the industry.

Another interesting company was Congruency, which calls itself a communications application service provider. What it's doing is building voice-over-IP infrastructure and selling access to competitive local exchange carriers, building local exchange carriers and ISPs that will resell it to customers instead of investing in the voice-over-IP gear themselves.

Besides the back-end support, Congruency offers an IP phone with an integrated 3-by-5-inch touchscreen that lets users browse through things like voice mail, fax, e-mail and notes, and lets carriers drive applications.

I saw a demonstration in which the screen had an icon for a limo service. Hitting the icon established a Web link to the service provider and let me schedule a pickup. It isn't a standard Web interface, though, and Congruency plans to make money by helping carriers create applications for this format. The company will begin piloting the technology this summer and hopes to launch service in the fall.

Despite the recent stock market dip, there's no dearth of ideas that leverage the Internet.

— John Dix  
Editor in chief  
jdix@nww.com



Message Queue

### PRIVACY PRINCIPLES

As noted in the recent "Face-off" on biometrics and privacy (May 8, page 143), biometric technologies are carefully designed to prevent someone's identity from being revealed. Also, impostors cannot steal an identity by reverse-engineering the biometric code. Providers of biometric technology understand, however, that addressing public perceptions about the use of biometrics is the linchpin to the success of the industry.

For these reasons the industry has published privacy principles to guide members, end users and regulators in establishing rational controls on the use of biometric data. The principles state that:

- Safeguards should be used to ensure biometric data isn't misused to compromise information, or released without personal or legal consent.
- Private sector policies should set forth how biometric data will be used, and should preserve the rights of individuals to control the data.
- Public sector applications should be based on clear legal standards that define and limit the conditions under which agencies may acquire, access, store and use biometric data.
- In all cases, managerial and technical controls should be used to protect the confidentiality of databases containing biometric data.

The industry will accept coherent legal controls as long as they don't preclude voluntary enrollment in commercial programs, or arbitrarily constrict the use of biometrics by governments to solve a legitimate problem. Otherwise, it will be hard to design Internet-based services that are shielded from rampant identity theft and fraud, and it will hinder the use of biometrics to streamline social services, speed border controls, guard sensitive facilities and reduce crime.

Richard Norton  
Executive director  
International Biometric Industry Association  
Washington, D.C.

### BE FAIR TO NOVELL

Regarding "Tough times hit Novell" (May 8, page 1):  
All companies go through financial slippage

Send letters to [nnews@nww.com](mailto:nnews@nww.com) or John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

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## MORE ONLINE

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8421 find it online

when a host of new products and directions are announced. Novell has been working toward goals it has identified that the industry wants. The OneNet concept and other announcements at BrainShare show true vision, and Novell is the company with the foundation to deliver. It's wrong to start disparaging them and questioning their viability or commitment based on a slow period.

Eliot Lanes  
President  
Viable Solutions  
Orlando, Fla.

### TAKING STOCK

Ira Brodsky's column "What's spooking high-tech stock investors?" (May 8, page 117) has got it wrong, starting with the title. These days the stock markets are not the domain of investors, but of speculators with little or no understanding of, or concern about, valuation. Since 1988, it's all come down to the "bigger fools" theory. If someone will pay more than you, who cares how much you pay?

Brodsky states that there are no "correct" stock prices. I disagree: There are correct pricing models. Buying a stock is like buying anything else — caveat emptor. It's up to the buyer to establish "correct" value, but when the buyer throws all methods of valuation to the wind and deals only in the bigger fools method of valuation, there ceases to be any reasonable discipline or control with pricing.

Brodsky concludes by saying that the government should "bolster confidence." I agree, but at what price? I would have some level of confidence if the prices fell on the Dow and Nasdaq by over 90% from where they are at the moment. Then perhaps we could have some confidence that the stocks were actually worth their price.

Until then, the roller coaster is headed down as some level of sanity and reasonability in pricing comes back.

Jim Benfer  
Chairman and CEO  
MaxFrame  
Torrance, Calif.





## BEST TECHNOLOGY IS NOT ALWAYS THE BEST BUSINESS CHOICE

I am not an engineer, nor do I have any pretense to be one. I view technology from a business functionality perspective, which many times causes some conflicts between me and the technical personnel I manage. In many cases, the most elegant technology is not the best business choice.

Examples of this abound. Token ring is technically superior to Ethernet, but Ethernet has won in terms of market share. ATM is far better for integrated services than Fast or Gigabit Ethernet, but I don't believe many firms are seriously considering implementing desktop ATM. Open Systems Interconnection-based networking was more robust than TCP/IP, but TCP/IP is now the dominant standard. Novell Directory Services is more mature than Active Directory and currently a better choice for global enterprise networks, but most corporations today are actively engaged in implementing Windows NT/2000 for their internal network infrastructures. IPv6 is a more robust and elegant implementation of IP, but I think IPv4 will be around for a long time.

In short, the best technology is not always the best

business decision. Many factors have to be considered when choosing business-based strategic technologies. Items such as market share, installed customer base and implementation/conversion costs have to be analyzed. Also, the risks of adopting new technologies — including interruption and/or change of current business practices and potential loss of productivity during implementation — need to be reviewed.

We need to remember that businesses do not exist for technology. Rather, technology exists for businesses. If adopting a certain technology will incur more expenses and/or risks than benefits received, then the technology probably should not be adopted no matter how technically elegant it is.

Unless a technology brings needed functionality that cannot be met by current products, resolves specific problems a business is facing or positions the company for future growth, management needs to seriously question the reasons for adopting the technology. The best technologies for a business are the ones that meet the company's needs, position it for growth, ensure an appropriate return on investment,

are supportable with available workforce, are fiscally responsible and have a proven record.

These are not always the most elegant or sophisticated technologies. This is sometimes hard for technical people to understand; however, management needs to help them understand. Through sponsored training, companies need to instill in their technical staff a comprehension of business needs and constraints. And technical staff need to accept this training just as they would accept the opportunity to gain additional certifications.

By combining the expertise of their technical staff with basic business acumen, companies can better use these technical resources to ensure the most appropriate technologies and strategies are chosen. By adding basic business knowledge to their technology skills, technical personnel can ensure they will be seen as a valued resource making important contributions to the success of their companies.

*Yoke is an IS manager in Denver. He can be reached at ckyoke@yahoo.com.*

## Speaking the LANguage . Linda Musthaler

## ASP MODEL GETS HIGH MARKS FROM CUSTOMERS

Last year, I made a not-so-bold prediction in this column that the nascent application service provider (ASP) market was about to take off. It did, in fact, so I'm feeling pretty smart about my prognostication. It wasn't hard to see then that a model that would save the customer money, get his application up and going in short time and allow for scalable growth would become a mainstream way to get IT functionality delivered.



Not quite a year later, we're starting to see maturation in the ASP market. (From infancy to maturity in under a year — now that's what I call Internet speed!) We can look back over the past year and see the signs of industry

consolidation, market focus, partnerships and alliances, some customer failures and many more customer success stories. In short, the ASP market has found its niche and is here to stay.

I spent a few days recently at the USInternet-working industry analyst conference. I expected to hear the usual marketing presentations from corporate executives, and yes, I did have to sit through a few of those. But the talks I found most interesting were the ones from USi customers. USi brought about 10 customers to the conference to tell us about their experiences. While of course they all had glowing remarks about USi's performance and service, they talked more broadly about how and why they chose the ASP model.

You may think these customers were flashy new start-ups or dot-com companies, and some of them

were. But other customers represented the opposite end of the spectrum — staid companies such as Blue Cross/Blue Shield of Michigan and Knoll Pharmaceutical that are conservative in their approach to IT. Start-up or century-old, brick-and-mortar or cybercorp, all of these customers sang the praises of a computing model that frees them from traditional hassles.

Before the customers took the stage, USi Chairman and CEO Christopher McCleary cited the seven problems the ASP market addresses: integration risk, large capital investment, system security, software licensing issues, complex networking, IT staff shortage and unpredictable costs.

Before the day was over, customer after customer confirmed McCleary's claim that the ASP model mitigates those problems. Knoll Pharmaceutical was looking for risk reduction, complexity reduction and a faster, more reliable implementation of a sales force automation project. They found it. Sunburst Hospitality needed to establish a financial processing system without creating an expensive in-house infrastructure. They did. High-tech consulting firm Belenos was looking for a scalable professional services administration application that would support the enormous growth the company has experienced in its first year. Problem solved.

After about the third or fourth customer presentation, I could almost predict the reasons the next ones would give for opting for an ASP solution, as well as the benefits their companies have already realized. The reasons/benefits cited most often were: reduce capital investments in industry-standard solutions; focus on business issues and let the ASP partner handle the IT issues; ensure high security for

business-critical applications; and allow for managed growth in a wildly unpredictable e-business era.

Industry-standard solutions are a key part of the maturation of the ASP industry. The providers have learned to focus their service offerings on repeatable, predictable, manageable solutions that have broad applications to many clients. Applications like Siebel for sales force automation, PeopleSoft for human resource management and Exchange for e-mail are ideal ASP offerings. The deployment of these applications is almost cookie-cutter, which helps to lower costs and decrease implementation times.

By the same token, ASPs have learned to forego customers that want highly customized applications. Even McCleary acknowledged that USi, recognized as one of the leading ASPs in the U.S., wants little to do with custom application development. The bread and butter for his company are applications with very broad appeal.

If you think you might have an application that is ripe for hosting outside your own data center, shop around. The Web site [www.webharbor.com](http://www.webharbor.com) is a good source for finding the ideal ASP.

If I had to summarize the advice given by the customers I heard last week, it would be this: Choose an ASP that takes a thorough approach to understanding your business. Select one with a "business partner" mentality. Look for business and technical expertise in the applications. And finally, find a provider that views you as a "recurring responsibility" rather than a "recurring revenue stream."

*Musthaler is vice president of Currid & Company, a Houston technology consulting firm. She can be reached at linda@currid.com.*



## Case study: American Electric

### Deregulation sparks utility merger

Consolidations are rife in the energy business as deregulation forces monopolies to adjust to a competitive environment. One prominent example is the pending merger of American Electric Power of Columbus, Ohio, and Central & South West Corp. of Dallas, which together will serve 11 states.

The utilities announced the deal in December 1997 and are expected to receive final approval sometime this summer. Executive management faced a morass of regulatory obstacles nationally and in each locality. It did not involve IT in the merger negotiations. Once the deal was struck, IT was told to come up with \$10 billion in savings over 10 years.

Because the merger was going to take at least two years to close, the IT transition team had time to perform an extensive evaluation of each company's infrastructure. The group examined everything from master time clocks to network switches and placed each technology in one of five categories:

- Watch: Emerging technologies that are not ready for prime time but should be kept under investigation.
- Promote: Technologies that business units are encouraged to use.
- Contain: Technologies to be approved for specific purposes only.
- Maintain: Technologies in place that will continue to be used but not extended.
- Replace: Technologies that IT is actively eliminating.

"The various committees encompassed almost everyone in the two IT departments," says Ken Foster, the IT transition team leader from CSW in Tulsa, Okla. "We learned from talking to the people who are down on the bare metal and understand specific technologies in detail."

The team wasn't just picking the system that was best in its current environment, nor was cost efficiency at the top of the list. The goal was to identify solutions that were highly scalable and highly adaptable, because the unbundling requirements of deregulation are pushing utilities into the unfamiliar waters of business-to-business e-commerce.

"Our cost-reduction goals are making us look at e-procurement technologies," Foster says. "My rough back-of-the-envelope assessment shows our B2B [business-to-business] activity increasing 3,000% in the next year, and my only concern is that I've underestimated it significantly."

— Susan Breidenbach

# Managing





# ing mergers

BY SUSAN BREIDENBACH

***Whether your firm is negotiating a megabucks merger or is vulnerable to getting gobbled up by a competitor, we'll tell you how to quickly integrate IT systems so the new company can get on with business.***

**I**magine arriving at work one morning to find your management is announcing a merger that was negotiated without any input from IT. Your new marching orders are to integrate two huge and disparate IT infrastructures, do it without disrupting internal or external customers, and reduce combined IT costs by 40%.

This is an increasingly likely scenario as the urge to merge spreads like a virus through corporate boardrooms. According to a study by Compass America in Reston, Va., at least 30% of the Global 2000 are currently considering an acquisition, and another 40% are potential acquisition targets. The dollar volume of mergers and acquisitions has increased more than five-fold since 1995, and Compass expects global merger and acquisition activity to reach \$5 trillion this year.

More than three-fourths of these mergers will fail to deliver the promised synergies, savings and shareholder value. But corporations really hit the jackpot when mergers do work. A McKinsey & Co. study found that companies formed through mergers that succeed go on to beat the stock market by 50%.

The odds of pulling off an effective merger increase significantly when IT is involved early in the game. The success of a merger hinges on the

ability of the IT department to plan and execute the necessary integration in a timely fashion. You have to establish core communications as soon as the law allows, decide which technologies to keep or replace, and hang onto key employees through the transition. Consider this your guide to expediting IT integration.

## **IT isn't the attraction**

Despite increasing automation and e-business initiatives, companies aren't being bought for their IT resources.

"For the most part, mergers are driven by business or product issues, not IT infrastructure," says Karin Maday, a managing director in KPMG Consulting's high-tech practice in Mountain View, Calif. When companies get superior IT through an acquisition, it's usually a pleasant surprise.

There are some exceptions. A traditional bank that wants to get into Web-based services might decide that buying an online bank is the cheapest way to get the necessary capabilities and skills. IT infrastructure may also factor into a roll-up deal when the goal is to consolidate several small players in a fragmented industry.

In that case, the acquirer looks for a target that has a



## Case study: First Union

### First Union banks on mergers for growth

First Union, the nation's sixth-largest bank, has a track record that is the envy of its industry. An aggressive growth-by-acquisition strategy has boosted the bank's assets from \$7.3 billion in 1984 to \$253 billion at the end of 1999.

All this experience has taught the Charlotte, N.C., bank the value of early IT involvement in the merger and acquisition process. IT participates in the due diligence phase and helps the executive management determine what kinds of expense efficiencies could be achieved by the merger.

The banking giant typically buys smaller competitors that operate in the same region, then combines operations and closes redundant facilities. The faster the integration, the less it will cost and the fewer disruptions there will be to customers.

"First Union converts acquisitions faster than any other large bank in the country," says Austin Adams, the executive vice president in charge of First Union's merger and acquisition integration activities. "Our average conversion time in the 1990s was three months."

When First Union acquired the second-largest bank in Florida and eliminated 27 branches, there was a net gain of only one location in the state. Despite all these closings, the transition was seamless enough that First Union retained more than 80% of the target's customers.

The savings on IT was even greater and the bank often achieves IT cost efficiencies of more than 50%, according to Adams. However, First Union's executive management understands that IT enables the whole merger and acquisition process and isn't just another expense to be cut.

First Union's IT managers use a cookie-cutter approach to integration that starts with a well-defined due diligence questionnaire. The bank identifies the differences between the two environments and compares service offerings to see if the acquired bank has unique products that bring First Union a new customer segment. "Then we have to consider what it takes to retain those customers," Adams says.

The general plan is to move the target onto First Union's infrastructure, but exceptions are occasionally in order. CoreStates was much stronger internationally when First Union acquired it in 1998, so First Union's international business was migrated to the target's systems.

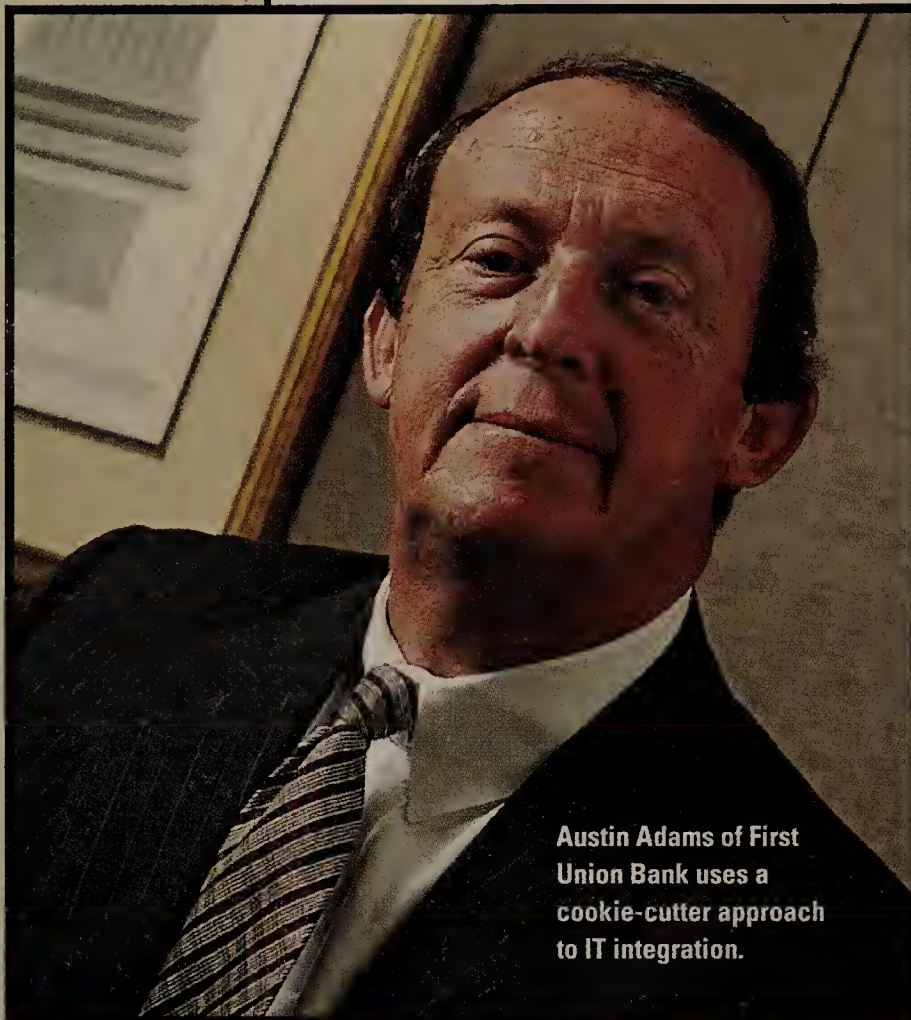
Regardless of whose technology wins, people are regarded as the most important component. "The technical issues are moot if the people issues aren't addressed," Adams says.

— Susan Breidenbach

scalable architecture, says John Kreidler, a partner in Shipman & Goodwin LLP in Hartford, Conn. Although his firm is helping a client in the medical supply market do a roll-up, "buying for infrastructure is really rare," he says.

Conversely, acquisition targets are rarely dropped because suitors don't like what they see once they get a peek under the IT hood.

"There were some Y2K situations where acquisitions were deferred until after the turnover, but I can't think of a single instance in which a merger didn't happen because of infrastructure problems," says Eileen Birge, research vice president at Concours Group, an IT consultancy in Kingwood, Texas. Instead, infrastructure problems are more



Austin Adams of First Union Bank uses a cookie-cutter approach to IT integration.

DONNA BISEMBE

likely to be reflected in the financial arrangements of the deal.

Austin Adams, the executive vice president who is overseeing First Union Bank's aggressive growth-by-acquisition activities, says the Charlotte, N.C., bank has never dropped a potential target because of its IT infrastructure.

"Sometimes the organization has some large outsourcing contracts that are in the early stages and are going to be very expensive to break, but that just means our management might have to adjust its financial estimates," Adams says.

### Stages of the deal

There is considerable debate about IT's role in the premerger evaluations and negotiations, which go through several phases. Gartner Group has defined six of them:

- Strategy — Senior management decides to fulfill its business objectives through acquisition, and may have no specific target in mind yet.
- Planning — Senior management selects

candidates or engages investment bankers to do so, and comes up with a "guestimate" bid to qualify as a suitor.

- Evaluation — Once qualified as a bidder, the company gets access to a limited amount of real information that is used to make a real bid.

- Acquisition — If the bid is accepted, the two companies enter into negotiations about final terms and conditions.

- Integration — The merger is consummated and the integration process begins.

- Operation — In the final state, the combined entity reaches its normal operating mode.

While industry experts have observed some encouraging trends, it is still common for IT to be excluded from talks until quite late in the process. "Clients say, 'They didn't tell us until the deal was done, and now we have some unrealistic goals to meet,'" says Gartner Group research director Michael Gerrard. "Instead, IT should be involved in the premerger process as soon as is practical."

Gerrard identifies two main reasons why mergers fail. In the first, the acquiring company isn't successful in culturally assimilating the target. Anticipated synergies are not achieved, and key people get frustrated and leave.

This is a bullet German Daimler-Benz AG and American Chrysler had to dodge when they stunned the world with their merger announcement in May 1998. The problem was compounded by the fact that the deal between the two automotive giants has initially handled as a true merger of equals — an M&A rarity — rather than an acquisition. At the time, Daimler-Benz was a \$71 billion company, while Chrysler had revenue of \$61 billion.

"The senior people in the two companies were open to new ways of doing things, and we were making some radical changes," says Sue Unger, the DaimlerChrysler senior vice president and chief information officer who is orchestrating the ongoing integration.

Unger, who came from Chrysler's headquarters in Auburn Hills, Mich., spent a lot of the official engagement period in Germany, talking directly to the Daimler-Benz IT staff — in English.

While subsequent events have proven otherwise, there was some concern among the German IT staff that the merger was really an American takeover. "We had to help people understand the changes and why it was important to make them," Unger says. "You can never do enough communication in a situation like this."

While DaimlerChrysler's stock price continues to disappoint shareholders, Unger's team has done its job. In its first year as a combined entity, DaimlerChrysler reported \$1.4 billion in synergy savings, and earnings growth has been outstripping revenue increases.

However, most integration efforts don't deliver the savings that were promised to the investment community, which is Gerrard's second main reason why merger and acquisitions fail. This may be caused by poor IT execution, but often it is a result of unrealistic upfront estimates. The earlier IT participates in premerger activities, the better these estimates will be.

If the estimates are off, your company is in

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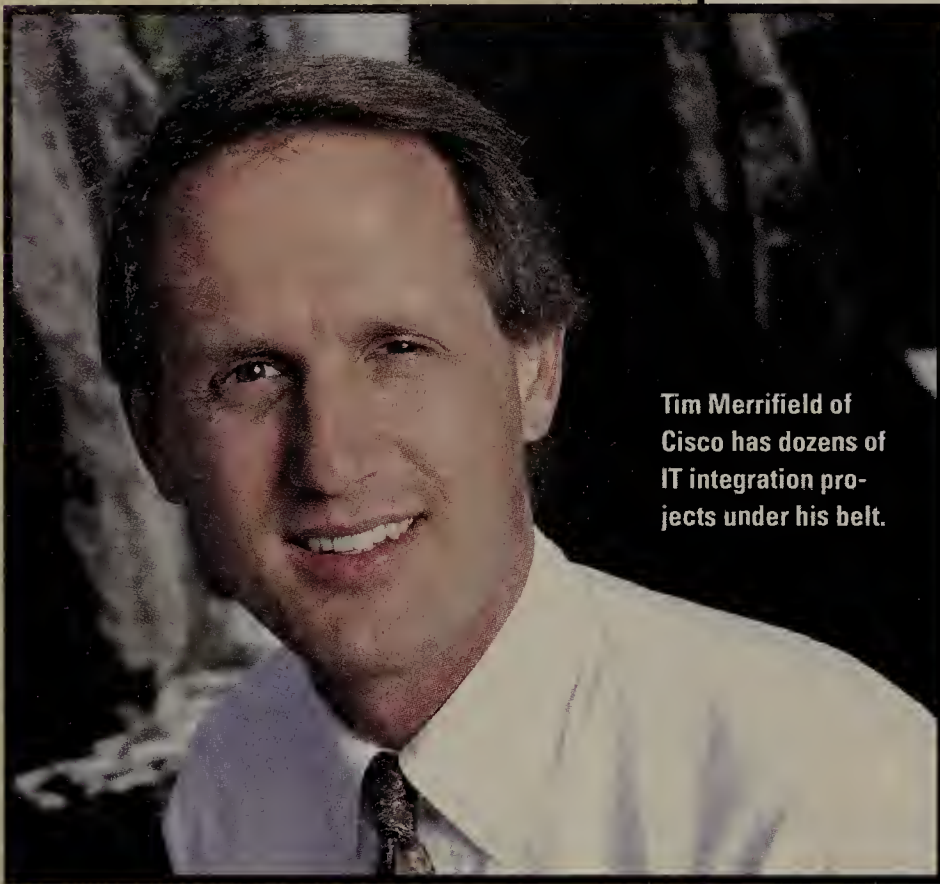
## Case study: Cisco

### Cisco is serious about snapping up competitors

Few companies have refined the growth-by-acquisition art better than Cisco, which has consummated 54 mergers in the past five years and is working on five more. The networking giant targets small start-ups for their intellectual capital, not their customers or manufacturing capacity.

"We acquire companies and integrate them completely," says Tim Merrifield, senior IT manager in charge of Cisco's merger and acquisition integration activity. "We don't have subsidiaries running their own systems, even temporarily. We learned that going slowly causes more problems than payoffs."

IT isn't consulted prior to the acquisition announcement because Cisco already has a method for quickly replacing the acquired firm's infrastructure with its own standard technologies. "We are on site the day of the announcement or within a few days. We let them know what our processes are and what is going to happen," Merrifield says.



Tim Merrifield of Cisco has dozens of IT integration projects under his belt.

The weekend after the acquisition is completed, the target is connected to Cisco's e-mail system and intranet. But while Cisco imposes its IT infrastructure on the new business units, Merrifield says, "Outside of the standard, corporate-based components, we are willing to learn from the targets."

Superior merger and acquisition integration is giving Cisco a competitive advantage, and Merrifield is always looking for incremental improvements to the process. After each target is absorbed, his team holds postmortems to discuss what worked and what didn't.

"You have to be open to feedback so you can make adjustments before the next integration project," Merrifield says. "Just because the process worked well in the past, doesn't mean it will work well in the future."

— Susan Breidenbach

Continued from page 70

trouble with Wall Street, Gerrard says. So much hinges on IT, and the businesses can't consolidate workforces until you consolidate systems. The cost of carrying two workforces gets dragged along with the IT delay costs.

According to a study of mergers by Concours Group, the amount that is ultimately spent on integration exceeds management's estimates by a factor of four to eight. The study also found that companies do a better job of coming up with realistic estimates when IT is involved earlier in the premerger process.

In highly IT-dependent industries, IT managers can bring some good perspectives to the discussion as early as stage two, which is when they are brought into First Union Bank's acquisition process.

"IT is very heavily involved from the time that we start looking at a company for possible acquisition," Adams says. "We have a very well-defined due diligence questionnaire and methodology."

The optimum point of IT entry also depends on the type of merger being considered. Cisco's acquisitions are highly successful, yet its IT professionals aren't included in premerger discussions.

"The cost of replacing the entire infrastructure of the target is immaterial compared to the market opportunity and the technology and the people we are getting," says Tim Merrifield, the senior IT manager responsible for Cisco's merger and acquisition integration activity. "It simply doesn't warrant us getting involved earlier. Our input does not in any way sway whether the company is purchased or not."

In highly regulated industries, mergers can take several years to complete. American Electric Power and Central and South West Services announced their engagement in December 1997, but the deal is still awaiting final approval.

The two electric utilities — based in Columbus, Ohio, and Dallas, respectively, and serving different regions — didn't bring their IT staffs into the merger and acquisition process until about six months after the merger announcement. The pending merger must run a full gauntlet of regulatory approvals in each state the two companies operate in before the deal is complete, and this challenge dwarfs IT integration issues.

In many deals, earlier IT involvement is critical but doesn't happen. There is often a sense that bringing in IT will complicate the exercise and confuse the issues.

"Most investment bankers don't want to hear why a deal shouldn't happen, so there is a natural tendency to ignore the operational integration issues," says Jim Champy, a vice president at Perot Systems in Boston.

"Companies tend to ignore these issues and simply assume they can be dealt with."

Consequently, IT gets handed an expense-savings goal after the fact and is told to reach it.

### Resetting expectations

When IT is not part of the merger and acquisition negotiations, the people calling the shots can make some naïve assumptions. They typically underestimate one-time integration costs, and are too optimistic about when the payoff will be realized.

Management looks at closing one branch location, and assumes 50% of the combined facilities' cost is being eliminated. Then they try to approach IT the same way and don't factor in the cost of integration. For example, senior executives may assume you can simply drop one enterprise resource planning (ERP) system and eliminate the second license fee, when integrating these often highly customized environments can take a few years.

"Our management called the IT transition team in one afternoon, handed us a list of goals, and told us to draft a plan for achieving them by the next morning," says one IT professional who recently led the integration efforts in a large merger. "We had less than 24 hours and we didn't have enough information, so we abruptly decided to close a very well-run data center. This turned out to be a big mistake."

IT managers who are faced with similar situations need to be very proactive about managing expectations — both internal and external. Sit down with senior executives and walk them through all the IT work that has to be done. If you're going to need to add staff or get help from an outsourcer, now is the time to say so.

If the target is large, you may not have the capacity to support it. If you can't, it might take a year and a half to close data centers that management had slotted for extinction in six months. There also might be some unpleasant surprises in the target's infrastructure, such as a big phone system that is obsolete and past due for replacement. These sorts of things don't show up in a balance sheet analysis.

Another potential minefield that may get overlooked is the contracts the acquired company has with external service providers. It may be expensive to change or break them, which can have a major impact on anticipated cost savings.

Just what kinds of savings can you expect? In IT-dependent industries such as financial services, merger and acquisition experts have seen mergers produce IT costs reductions of as much as 40%. First Union has sometimes done even better than this.

"In in-market acquisitions involving contiguous territories, we can sometimes get 30% to 40% expense efficiencies overall, and north of 50% on the technology side," says First Union's Adams. "In general, we are converting them to our systems and eliminating theirs. In out-of-market acquisitions that are geographic expansions, the initial savings are more in the 10% to 15% range."

Maximize your early returns by identifying and focusing on the things that will provide the biggest impact with minimum risk.

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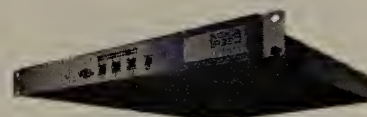
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## Best practices

- **Move quickly and communicate clearly.**

If you wait a month or two to start building a single team, it will be too late. The new management team should be in place on day one, and reporting structures should be established in the first few weeks.

- **Establish and thoroughly empower a transition team.**

Make sure everyone knows who is in charge and give these people the power and the obligation to make the tough decisions. Consider bringing in a third party that has no vested interest in either infrastructure.

- **Manage staff attitudes and expectations.**

You only get one chance to make a first impression, so plan how you will present your organization to the acquired IT staff from the outset.

- **Don't be too democratic.**

If one IT organization is to be the surviving one, say that upfront. Involving the acquired company's rank-and-file staff too much can generate a lot of contention.

- **Budget lots of time for people issues.**

As important as technology integration is, people have to come first. Count on staffing issues taking up 40% of your time.

- **Don't overanalyze and overintegrate.**

Don't bother with granular best-of-breed technology comparisons. Unless the acquired company has a highly differentiated infrastructure, stick with the acquirer's model and use the target's strengths as examples for improvement.

- **Think customers and business results.**

Take special care to make IT decisions based on how internal and external users and business processes will be impacted.

- **Don't mix mergers and forklift upgrades.**

It's tempting to use a merger as an opportunity to do a sweeping upgrade, but increasing the amount of change multiplies the risk of failure.

- **Prepare for a possible merger and acquisition in your company's future.**

Standardize system interfaces and think about how you would deal with a rapid increase in network traffic and transactions. Such readiness can shorten integration time and reduce the risk of failure.

- **Lobby for early involvement in the next deal.**

Document the impact IT has on the organization and make a case for earlier involvement in the future. Bringing IT into the merger and acquisition process early on greatly boosts success rates.

- **Consider merger and acquisition specialists.**

If your company embarks on a growth-by-acquisition strategy, you need dedicated merger and acquisition specialists on staff.

- **Document and improve on merger and acquisition planning and execution.**

Approach merger and acquisitions as an evolutionary process to which you make incremental improvements. Hold postmortems and outline problems that can be avoided the next time.

- **Use a process-driven approach to merger and acquisitions.**

Don't simply make lists of what has to be done; develop processes, with checklists within each of them.

— Susan Breidenbach

Continued from page 72

When provincial telcos in Alberta and British Columbia merged last year to form the Vancouver firm Telus, the IT transition team prioritized integration tasks by weighing its potential savings against how soon they could be achieved.

"In most cases, combining data centers would have a large potential for savings and can be implemented fairly quickly if you are not attempting to consolidate applications," says Jim Halco, director of IT integration for Telus. "You can move the applications from both companies into a single data center and get some economies of scale. With falling bandwidth prices, distances are becoming unimportant, and it doesn't really matter where the applications are running."

As you start the IT integration, report back up the chain constantly with your success stories. This may seem obvious, but experts say it doesn't happen enough.

### Taking stock

Once the deal is struck and you get your marching orders, it's time to see how the acquired company's infrastructure stacks up against yours.

The type of merger will tell you what level of analysis you should do. It could range from a quick glance to an exhaustive inventory of both environments that will reveal who has the best practices in which areas. (See DocFinder 8425 for an explanation of merger categories.)

Say a major oil company acquires a small refining company. They are just buying the refining assets; the IT infrastructure is unimportant. You have the same situation when a big bank buys a little one that is only 3% or 4% of its size. When companies make a regular practice of growing through such acquisitions, they develop a cookie-cutter rollout for replacing the target's systems with their own.

Other mergers must determine which company has the best practices in certain areas. "You aren't just counting the assets, you're looking for a good understanding of them: How they can be integrated, what their value is, what constraints come with them, and what risks they pose to your future plans," Gartner Group's Gerrard says.

Note that combining best-of-breed elements from two companies takes extensive upfront analysis and is much more complex than simply imposing the acquiring company's infrastructure on the target. According to Gartner Group, it is the most risk-prone path you can take.

In any given area, neither company may have the appropriate technology in place. For example, if both companies have highly customized ERP systems, the combined entity might be better served by a simpler, out-of-the-box solution. "It also may make sense to keep some systems separate until the next natural technology upgrade point," says Jonathan Poe, a vice president and industry analyst at Meta Group in Burlingame, Calif.

And some systems may have to be kept apart indefinitely. At DaimlerChrysler, the

automated assembly lines with their complex robotics are so different in the Mercedes and Chrysler manufacturing infrastructures that having the same system supporting both of them doesn't make much sense right now.

Some of the IT consultancies have put together databases of the best practices of Fortune 500 companies that you can use as benchmarks for evaluating your own environment. "We can tell you that for a company in a specific industry, there are IT operational processes that will work at a certain speed for a certain dollar value," says Gregory Smith, head of the merger and acquisition practice at Compass America.

In some cases, speed may be more important than choosing technology pieces. "Unless the target's system has a unique and differentiating aspect that affects your customer relationships or how you face the market, you normally should trash the system and replace it with yours," Concoors Group Birge says.

Speed is also a major factor in integration costs. First Union integrates acquisitions in about three months, which reduces expenses and helps maintain the target's customer base. "At the end of the day, spending money on making the deal work is taking resources away from growing your company," Poe says.

You may not get any advance warning of a merger, so you need to be ready for it. IT managers who don't plan for a merger and acquisition before it hits them are like deer caught in the headlights.

*Breidenbach is a freelance technology journalist and consultant. She can be reached at sbreidenbach@usa.net.*

**Motivating the troops: Turn to page 83 to find out how to prevent your staff from fleeing once they catch wind of a pending deal.**

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To implement voice over IP to any extent you need a voice-over-IP gateway — a seemingly magical box

that transforms telephone calls between plain old telephone service (POTS) on the one side and an IP data network on the other. We brought three of the leading voice-over-IP gateways into the Mier Communications' lab in Princeton, N.J., and found out what makes them leaders in this new, but burgeoning, voice-over-IP marketplace.

We awarded the Network World World Class Award to Nuera Communications' ORCA GX-8. The ORCA GX-8 supports the best redundancy and the most straightforward and complete management capability of the products tested.

This was a close match, and Cisco's AS 5300 gateway, featuring the lowest per-channel price, finished just inches behind Nuera. Clarent's Gateway 400 also turned in a laudable performance and earned high ratings for its integral features, but slipped behind the other two, mainly in management and ease of use.

More than one dozen vendors of voice-over-IP gateways were invited to participate in this open competition. To qualify, the gateway had to support a minimum of one — and up to four — T-1s of voice traffic load. This equates to a capacity of roughly 100 concurrent real-time telephone calls.

#### Rating voice over IP

Our evaluation of voice-over-IP gateways was based on:

- Performance, which encompassed more than a dozen measurements and metrics including voice quality and interactive call quality under various settings; latency; bandwidth consumption; call set-up time; call completion rate; and redundancy failover.
- Features, including the scope of settings and parameters accessible to a user for adjusting and tuning the voice-over-IP network; the gateway's ability to set bits in the voice-over-IP packets for prioritization; and transparent support for fax and modem calls.
- Management and administration criteria, including intuitiveness and effectiveness of management interfaces — whether graphical or command-line; real-time monitoring capabilities; scalability for centrally managing many gateways within the same call agent domain (per Media Gateway Control Protocol, or MGCP) or gatekeeper zone (per H.323); and additional management capabilities such as event, alarm or trap monitoring, and the generation of manage-

# VoIP gateways side by side

**Nuera's ORCA GX-8 tops market leaders with redundancy and management features.**

BY EDWIN MIER AND MICHAEL HOMMER SR.,  
NETWORK WORLD TEST ALLIANCE

ment reports.

- Configuration criteria, including telco interfaces supported; vocoders supported; modularity and density; and support for redundancy and component-failover configurations.

- Installation, ease of use and documentation.

## NetResults



### ORCA GX-8

Version 6.0 (gateway) with SSC Softswitch (call agent) software, Version 6.0, running on HP-UX Version 11.x

**RATING: 9.00**

**COMPANY:** Nuera Communications, (858) 625 2400, [www.nuera.com](http://www.nuera.com). **COST:** \$67,000 for gateway (\$349 to \$698 per channel, depending on vocoder); \$60,000 for SSC Softswitch hardware and software. **PROS:** Maximum redundancy; easiest to set up; real time monitoring. **CONS:** System components are physically larger, take up more space.

### AS 5300

AS 5300 (gateway) with Cisco 3620 Multimedia Conference Manager (gatekeeper), both running IOS Version 12.1 (1a)T

**RATING: 8.55** **COMPANY:** Cisco, (408) 526 7208, [www.cisco.com](http://www.cisco.com). **COST:** \$47,100 for gateway (\$491 per channel); \$7,600 for gatekeeper; \$9,995 for management software. **PROS:** Based on common Cisco router platforms; IOS command line for management. **CONS:** Limited modem support; limited real time monitoring.

### Gateway 400

Version 3.1a (gateway) with Command Center (gatekeeper) Version 3.1

**RATING: 7.90** **COMPANY:** Clarent, (650) 306 7511, [www.clarent.com](http://www.clarent.com). **COST:** \$95,000 for gateway (\$990 per channel); \$32,000 for Command Center (gatekeeper) software, for four T 1s (\$8,000 per T 1). **PROS:** Real time monitoring. **CONS:** Must edit Windows NT registry to set up and configure; multiplicity of management applications and graphical user interfaces; longer latency, call setup times.

	Performance 30%	Features 25%	Management and administration 25%	Configuration 10%	Installation, ease of use and documentation 10%	Total score
ORCA GX-8	9	9	9	9	9	9.00
AS 5300	9	9	8	8	8	8.55
Gateway 400	8	9	7	8	7	7.90

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score.

A call agent is a separate, stand-alone node defined in the MGCP specification that handles call routing and call setup. An MGCP call agent manages multiple gateways within a mutually exclusive area called a

#### Nuera Communications

### ORCA GX-8



We award our highest honor — the Network World World Class Award — to Nuera Communications' ORCA GX-8, which supports the best redundancy and the most straightforward and complete management capability of the voice-over-IP gateway products tested.

domain. The call agent functionally is akin to a gatekeeper, as defined in the H.323 specification, which oversees gateways within an administrative area called a "zone."

These differences in terminology underscore a major concern that permeates the voice-over-IP industry — a proliferation of functionally equivalent standards.

The three voice-over-IP gateways we tested each employ different call-control protocols (see Table 1, page 78 ). Nuera's product is based on MGCP. The vendor says that it also supports another, related standard called Session Initiation Protocol (SIP), which Nuera uses for communications across MGCP domains, and between call agents.

The Nuera call agent software runs on a dedicated processor running Hewlett-Packard's HP-UX. As with the other products, we tested the Nuera gateways with up to four full T-1s of traffic and we would "slam" the system by delivering calls to the gateway at a rate up to 48 calls per second.

The Nuera system didn't flinch at this load: The successful call completion rate always exceeded 99.9%, and calls were always set up and ringing at the other end in less than a second. What's more, voice quality was consistently very good to excellent (see graphic, right). Nuera's calls exhibited the lowest latency — just 63 msec one way, end to end — of the three gateways tested.

All three gateways consistently garnered voice quality ratings well above the 4.0 level that equates to toll quality. The ratings are based on blind panel assessments of male and female voice recordings that have been sent through the voice-over-IP systems, using a five-point ITU-specified rating scale and test procedure called the Mean Opinion Score



(MOS). Even using various bandwidth-conservation techniques — including low-bit-rate coders and voice-activity detection — voice quality still scored well above toll-quality ratings.

Nuera's management consists of two clean Windows applications — one for gateway management, the other for the call agent — which ran together on a Windows NT management station. Together they offer comprehensive management of the voice-over-IP package. Configuring or checking the status of any channel, card or component is straightforward.

Another big plus for Nuera is the degree of failover redundancy supported by the gateway. Besides power supplies and fans, Nuera's ORCA GX-8 multislotted chassis supports a fully redundant, failover control module. You can even upgrade the software of the redundant control module, and then switchover between active and hot-standby modules without dropping calls or having to reset or reboot the gateway. We note, too, that Nuera's Unix-based call agent can also be configured with a redundant hot-standby platform.

On the Mier Scale of Hardness, in which 1 is the village idiot and 10 is a rocket scientist, we feel a Level 5 can handle the setup and management of a Nuera voice-over-IP network, given the gateway, call agent and software tools offered.

#### Cisco knows voice over IP

According to recent market studies, a significant portion of the current voice-over-IP installed base is running on Cisco AS 5300s, the same voice-over-IP gateway that Cisco submitted for this testing. It's not hard to see why: The system is reliable, full-featured and straightforward to manage.

The Cisco package is currently based on H.323, which is the most widely embraced voice-over-IP protocol. Cisco says it has added MGCP and SIP to its current IOS operating code, but stops short of proclaiming that MGCP or SIP are fully deployable at this time.

The AS 5300 is a Cisco router running a recent version of IOS — ours ran a version of 12.1. There are special modules required for voice over IP, however, called voice feature cards. The H.323 gatekeeper in Cisco's voice-over-IP package is also a Cisco router. Ours was a 3620, also running the same version of IOS. The gatekeeper cannot function as an MGCP call agent; Cisco says you'd need a third-party call agent today if you want to run MGCP.

From a performance perspective, the Cisco voice-over-IP package fared as well as Nuera's ORCA GX-8. There were no statistically significant differences between Nuera's and Cisco's voice quality, interactive call quality, call setup time or any other metric we measured.

Compared to Nuera's management applications, we thought that Cisco Voice Manager (CVM), a Java application that is included as part of CiscoWorks 2000, was not quite as complete or useful. For example, throughout the CVM software you have to manually refresh a particular screen, data element or table to see the latest updated value. We thought this severely impacted the software's use for real-time monitoring of voice-over-IP activity.

For configuration, however, CVM is more than adequate, and its on-screen help is excellent. It seems to us that by using other pieces of CiscoWorks 2000 as well — including CiscoView, for example — you could get a better overall picture of your voice-over-IP network. CiscoView gives you a graphical image of whatever remote Cisco platform you want to manage, including Cisco's AS 5300 and 3620 voice-over-IP systems. Then by double clicking on a particular port or module, you can obtain real-time status and traffic statistics.

However, this would be a piecemeal picture, involving various applications and interfaces.

A Cisco tech support person was on site during the testing, and we noted that he used the Cisco command line for virtually all configura-

tion and management tasks. That is not at all uncommon among Cisco aficionados, although the command structure for voice-over-IP network configuration and operations is fairly elaborate and original. But what's

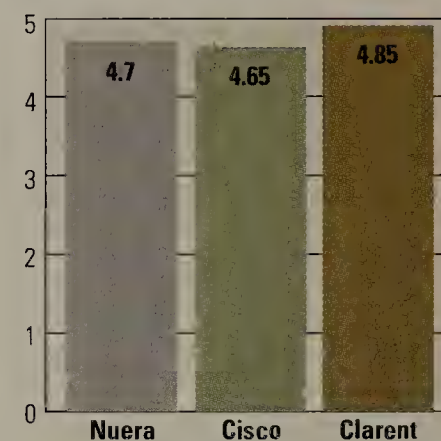
Continued on page 80

**Figure 1: Voice quality measurements**

**Our testing showed that voice quality was consistently very good to excellent across the voice-over-IP gateways reviewed.**

**A. Voice quality, optimum\***

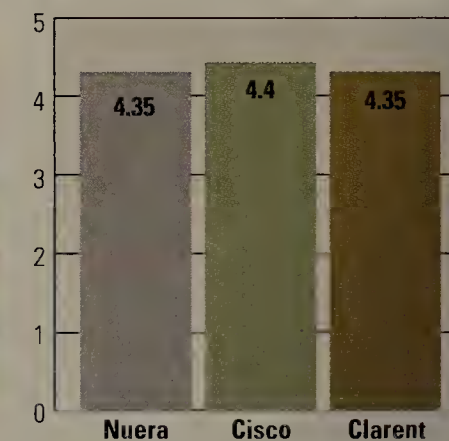
Mean Opinion Score (MOS)



\* Based on G.711 encoding; no voice activity detection (VAD); 20 msec voice samples per packet; bandwidth equals 87.2K bit/sec in each direction.

**B. Voice quality, bandwidth-efficient\*\***

MOS



\*\* Based on G.729 or G.729a encoding, with VAD; 20 msec voice samples per packet; bandwidth equals approximately 16K bit/sec in each direction.

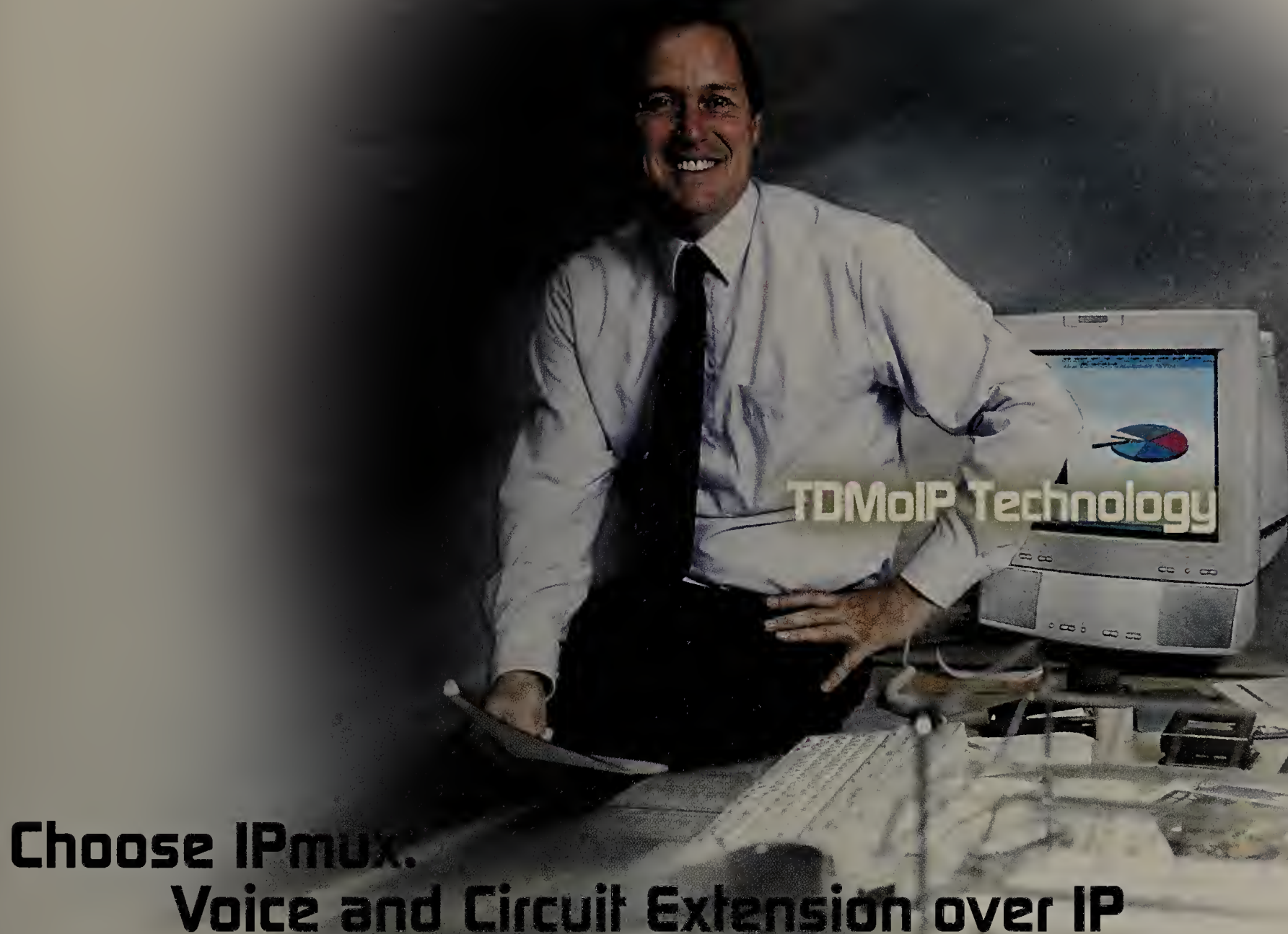
MOS ratings are per ITU procedures; scores shown are average of separately rated male and female recordings by a blind panel of 10 people. A MOS rating above 4.0 is considered toll quality.

**Table 1: Voice-over-IP gateway details**

Vendor	Nuera	Cisco	Clarent
<b>Gateway</b>	ORCA GX-8, a multislotted, modular chassis	AS 5300, an IOS-based router, modular chassis	Gateway 400, a self-contained, NT-based system
<b>Gatekeeper or call agent</b>	SSC Softswitch, an HP-UX-based call-agent system	Multimedia Conference Manager, an IOS-based router	Command Center, a self-contained, NT-based system
<b>Max channel capacity (based on T-1), per gateway</b>	Vocoder dependent; from 96 channels (four T-1s) with G.729, to 8 T-1s with G.711	96 channels (four T-1s)	96 channels (four T-1s)
<b>Max capacity per gatekeeper zone or call agent domain, according to vendor (not verified)</b>	From 1,000 to 20,000 channels per domain, depending on HP-UX call agent processor	Up to 400 T-1s/E-1s per zone, or up to 12,000 channels (DS-0s)	Up to 4,000 T-1s/E-1s (1,000 gateways) per zone, or 24,000 channels
<b>E-1 support, max capacity</b>	Yes; max capacity varies with vocoder	Yes; 120 channels per gateway with E-1 cards	Yes; 120 channels per gateway with E-1 cards
<b>Call control protocol</b>	MGCP (tested); call agents communicate interdomain via SIP (not tested)	H.323 Version 2 (tested); limited support for SIP and MGCP is offered (not tested)	Proprietary (tested); an H.323-based gatekeeper is alternately offered (not tested); MGCP edge devices
<b>Vocoder support</b>	G.711, G.729, G.729a, G.723.1, G.726, GSM and proprietary (4.8, 7.4 and 9.6K bit/sec)	G.711, G.729, G.729a, G.723.1, G.726, and G.728	G.711, G.729a, G.723.1, G.726, G.727 and proprietary (4.8, 7.4 and 9.6K bit/sec)
<b>Fax support</b>	Yes; autodetects on same ports as voice	Yes; autodetects on same ports as voice	Yes; autodetects on same ports as voice; requires separate software license
<b>Modem support</b>	Yes; 28.8K bit/sec confirmed in tests	Limited; only on channels set for G.711	Yes; 28.8K bit/sec confirmed in tests
<b>Management access</b>	Windows applications on NT for gateway; telnet (CLI) or Windows, Java app for SSC (call agent)	Telnet (CLI) or Java-based applications — Cisco Voice Manager	Windows applications that run on respective NT-based units; can be remotely accessed, including in CLI/telnet mode



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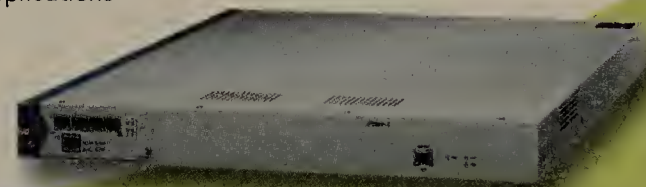
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Continued from page 78

another dozen or so commands on top of the existing Cisco command-line interface?

On the same Mier Scale of Hardness, we feel a Level 6 or 7 would be needed to set up and manage a Cisco voice-over-IP network.

There is one other area where we Cisco scored slightly behind Nuera, and that was in configuration. We note that Nuera's gateway, while

conspicuously larger than either Clarent's or Cisco's, offers the most options for bullet-proofing the system, and those options make the system much more bullet-proof than the competitors' products. Cisco's AS 5300 does not support nearly the same degree of optional failover redundancy, which we think is key if voice over IP is to take on the existing POTS/public switched telephone network with any hope of supplanting it.

#### Clarent: One step behind

Clarent offers an H.323-based gatekeeper, but the vendor submitted its Command Center running the vendor's proprietary call-control protocol for this testing. The NT-based Command Center is functionally equivalent to an H.323 gatekeeper or an MGCP call agent. According to the vendor, performance is better running the proprietary protocol, as long as all your gateways are from Clarent.

The Clarent Gateway 400 is also an NT-based system. But don't think the system suffered any inherent stability problem as a result. The Clarent package exhibited reliability just as good as Nuera's or Cisco's, with the same 99.9% successful call-completion rate. The system also handled being slammed with 48 call setups per second and didn't miss a beat.

A couple aspects of Clarent's performance were less than optimum. Clarent's interactive call quality was notably lower than Cisco's or Nuera's (see Figure 2, left). The reason for this was latency. One-way, end-to-end latency for Clarent voice-over-IP calls was on the order of 125 msec, compared to well less than 100 msec for Nuera and Cisco.

Clarent's score in this test was 3.0 to 3.66, below the 4.0 threshold that is regarded as toll quality. The additional 25 msec in one-way, end-to-end latency can readily be detected in our interactive tests. Remember that the net result in interactive conversations is an extra 50 msec round-trip delay, and most listeners would consider that delay an annoyance.

In our testing of interactive call quality we added 10 msec to the actual latency, to simulate propagation delay and additional router hops that real voice-over-IP callers would experience over a 1,000-mile distance. In the case of Clarent, the resulting cumulative delay equated to a minor, but noticeable, annoyance in our interactive tests.

Another small issue was call set-up time. Where Cisco's and Nuera's systems would set up voice-over-IP calls in less than 1 second, call setup via the Clarent voice-over-IP network was consistently longer than 4 seconds.

Clarent fared well in general, however, earning a 7.9 score overall. The lowest scores it received were in the management and administration category, and in installation and ease-of-use ratings. Clarent's management consists of five different Windows applications, which in our estimation, was too many. We concluded that while the applications were all fill-in-the-blank type tools, they were more than a little disjointed and considerably less than intuitive to navigate.

The Clarent systems, both the NT-based gateway and the NT-based Command Center gatekeeper, were the most tedious and difficult of those tested to get up and running.

Considerable editing of the NT Registry was also required. On the same Mier Scale of Hardness, we think a Level 8, and perhaps a Level 9, would be needed to correctly set up and run a Clarent voice-over-IP network.

The vendors whose gateways we exercised in this test series are among the marketplace leaders. All three performed well, and were reliable and effective products for rolling out an enterprise voice-over-IP network. Even so, it's clear that in addition to finding the best available voice-over-IP gateways, enterprise networkers face a sharp learning curve in understanding the subtle intricacies of voice over IP and what's involved in making voice-over-IP products work well.

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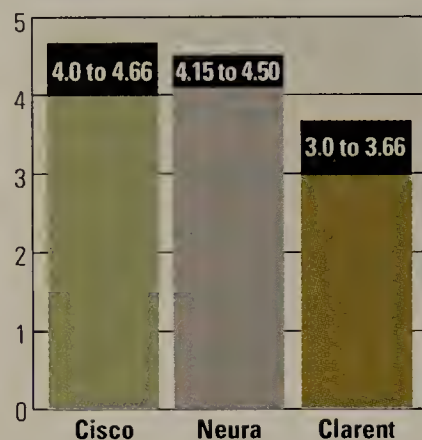
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## Figure 2: Interactive call quality

Pairs of Mier Communications testers established multiple calls, conducted special tests, and then rated the interactive call quality based on effects of latency, bidirectionality and clarity/background noise. On a five-point scale, testers determined that the interactive call quality of Clarent's voice-over-IP gateway fell behind Cisco's and Nuera's products.

Ratings by lab testers\*



\* Range of ratings by Mier lab testers for different vocoder and voice activity detection settings, scored on a five point MOS scale.

## How We Did It

These voice-over-IP gateways were tested according to a comprehensive methodology created by Mier Communications, first applied in 1997, and continually refined and enhanced since. The test-bed topology varies somewhat depending on the metric being tested or measured. An assortment of test systems and tools are applied at one point or another.

For this particular review, these voice-over-IP gateways were configured on separate "remote" LAN subnets that were separated by an IP WAN consisting of Cisco 4700 and 7200 LAN/WAN routers. For testing voice-over-IP voice quality and interactive call quality, each LAN subnet was connected to the IP backbone via a Cisco 4700 router and T-1 WAN links. The T-1 passed through an Adtech SX/12 T-1-WAN simulator, which introduced errors, latency and jitter as specified by the tester. Other WAN transmission environments and anomalies were introduced via the Shunra

Cloud, a Windows NT-based software simulation environment from Shunra Software.

To test load (up to four full T-1s of bidirectional call load are applied in these tests) and call-completion rate, the LAN subnets were connected to the IP backbone via Cisco 7200 routers and T-3 WAN links. The plain old telephone system part of the test bed consisted of TSU 100 multiplexers and Atlas 800 switching equipment from Adtran.

Hammer Technologies' Hammer IT Call Center Telephony Load Testing System and Hammer Loadblaster 500 systems were used to apply up to four full T-1s of call load, and to send and record the male and female voice recordings that were then rated by blind panels to yield the voice quality mean opinion score (MOS) ratings. The Hammer equipment was also used to measure latency.

The Telegra FAX test system from Agilent

Technologies was used in this test round to test fax transmission through the voice-over-IP gateways. Conventional PCs with V.90 modems were used to test modem transmission through the voice-over-IP network. The Agilent Internet Advisor, a network analyzer, was used to measure the packet size, packet rate and bandwidth of each different voice-over-IP setting.

Because blind panel MOS voice-quality ratings are based on voice recordings that are sent one-way through the voice-over-IP network, they do not address or measure some aspects of voice over IP that also greatly affect call quality, such as latency and bidirectionality. Mier Communications has developed its own tests and procedures for objectively assessing interactive call quality, which focus specifically on these other parameters affecting overall voice-over-IP quality. These tests and procedures were applied for this review.



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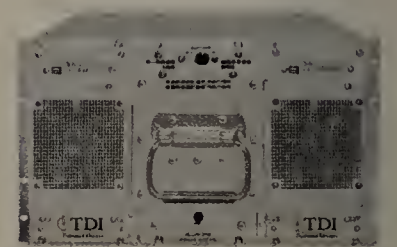


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# Management Strategies

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## Minimizing mutiny

**Here are some tips for keeping staff from jumping ship when your firm is part of a merger or acquisition.**

BY SUSAN BREIDENBACH

**I**t managers tend to focus on technology issues when their companies are undergoing mergers, but workforce management is the real challenge. Whether you want to keep individual staff members permanently or only through the transition, everyone has to be motivated to pull off the integration.

"We get people excited about their new opportunities at Cisco," says Tim Merrifield, a senior IT manager in San Jose who heads many Cisco integration projects. "They have an incentive to execute the transition as quickly as possible so they can get to those opportunities."

Retention is easy for Cisco, which offers the prospect of high growth, stock options and ever-expanding possibilities.

New employees want to be part of Cisco, so extra incentives are generally not necessary.

For firms that don't enjoy Cisco's position, retention bonuses can be very effective.

"Companies should typically offer a 'stay incentive' — a bonus employees get if they stay through the transition period," says Gregory Smith, director of the mergers and consolidations practice at Compass America, an IT consultancy in Reston, Va. "This will keep people focused on the end result."

So how do you calculate such incentives? Experts say formulaic approaches — such as a month's pay for every year of service — don't work. "You could end up keeping the old legacy fogies and losing all the young, new-economy people," says David Ullis, global delivery executive of mergers and acquisitions for DMR Consulting in Edison, N.J.

Bonuses should be based on the importance of individual employees. "We've seen stay bonuses amounting to 25% to 50% of the employee's base salary," says Eileen Birge, research vice president at The Concours Group, an IT consultancy in Kingwood, Texas.

Don't condition such incentives on layoffs. In one merger, potential bonus money would accumulate for each month employees stayed through the pre- and postmerger transition period, which was

expected to span several years. But workers could cash in only if they were laid off at the end of that period.

"Some big bonuses piled up, and a lot of people wanted to get laid off in order to collect them," says the IT manager in charge of the integration project for a large company that recently went



through a merger. "They could get laid off a year after the transition period ended and get nothing."

It's also tricky to determine the transition period to tie to the retention packages. "If you offer six-month packages and the transition ends up taking 12 months, you find yourself in an extortion situation with your employees," Birge says. "If key people leave, you may have to replace them with expensive hourly contractors."

Before the merger is announced, analyze both firms' IT staffs and decide who the key people are and which jobs need to be redefined. "Figure out your ratio of employees to contractors on a full-time-equivalent basis," Ullis says. If you use a lot of contractors, you can announce that most of the reductions

will come from the contractor ranks. This should help keep employees from jumping ship.

Another important point is jobs shouldn't automatically go to the employees of the acquiring firm. "We look for the best talent, and the best candidate might be in the target company," says Austin Adams, executive vice president of First Union, a Charlotte, N.C., bank that has grown through a string of acquisitions.

When choosing key members of the transition team, identify people who know a lot about the target company's infrastructure. "These people know about all the IT problems that have been swept under the carpet," Merrifield says. "If they leave, I'm left holding the bag on an environment I know nothing about."

Have retention packages and job offers ready to hand employees the day the merger is announced to the entire company. "It is critical that the offers be communicated in the first couple of days," Birge says. "The really good employees are the first to leave." Follow up with one-on-one meetings during the next few days.

While the first days after the announcement are critical, they're just the beginning.

You must maintain clear, constant communication throughout the transition to minimize rumors and set the right expectations.

If layoffs are required, do them all at once and provide job placement help. "The way you deal with the people you lay off will affect the way people you want to retain view the company," says Karin Maday, a managing director in KPMG Consulting's high-tech practice in Mountain View, Calif.

Employees form attitudes about the acquiring firm as soon as the deal is announced, and these attitudes are then tough to change.

"On the first day, listen to them talk about their technology and make them feel good about what they have accomplished," Adams says. Involve key people so they feel they have an impact on the design of the combined entity.

Finally, realize how much time you'll spend dealing with people issues during acquisitions. "We recommend that companies budget 40% of the executive workload during mergers and acquisitions on managing workforce issues," says Michael Gerrard, a Gartner Group research director in Laguna Beach, Calif. "As scarce and valuable as IT people are, you really have to invest the time."

*Breidenbach is a freelance technology journalist and consultant. She can be reached at sbreidenbach@usa.net.*





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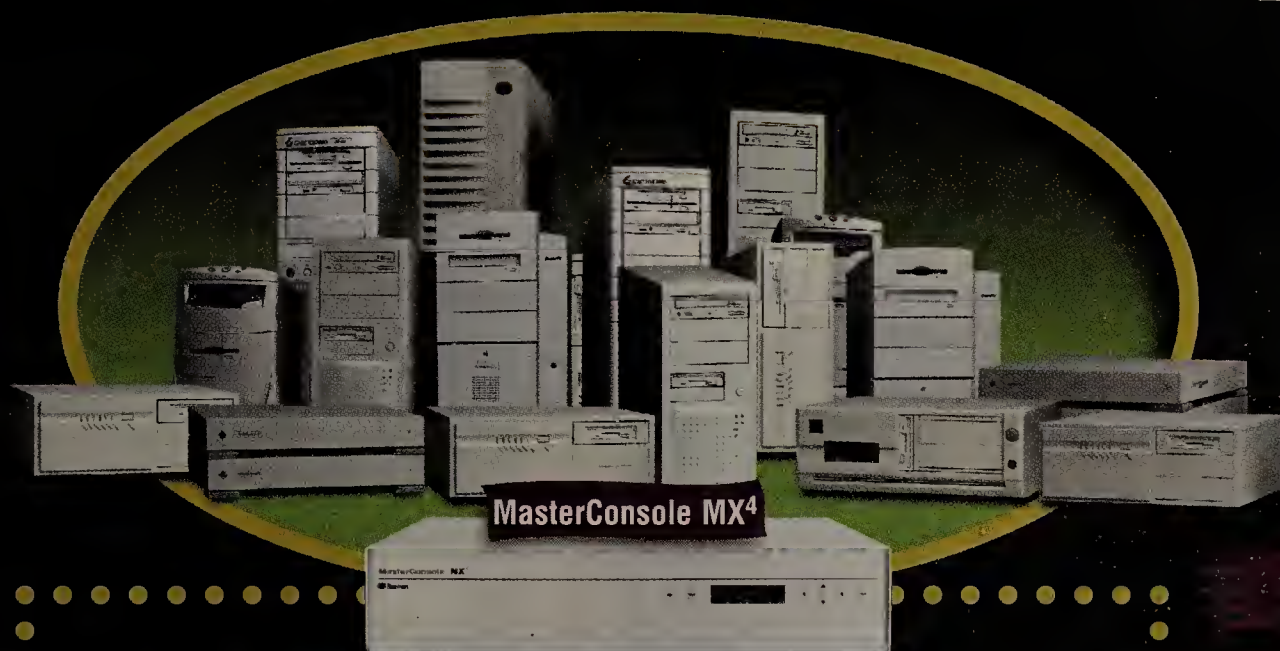
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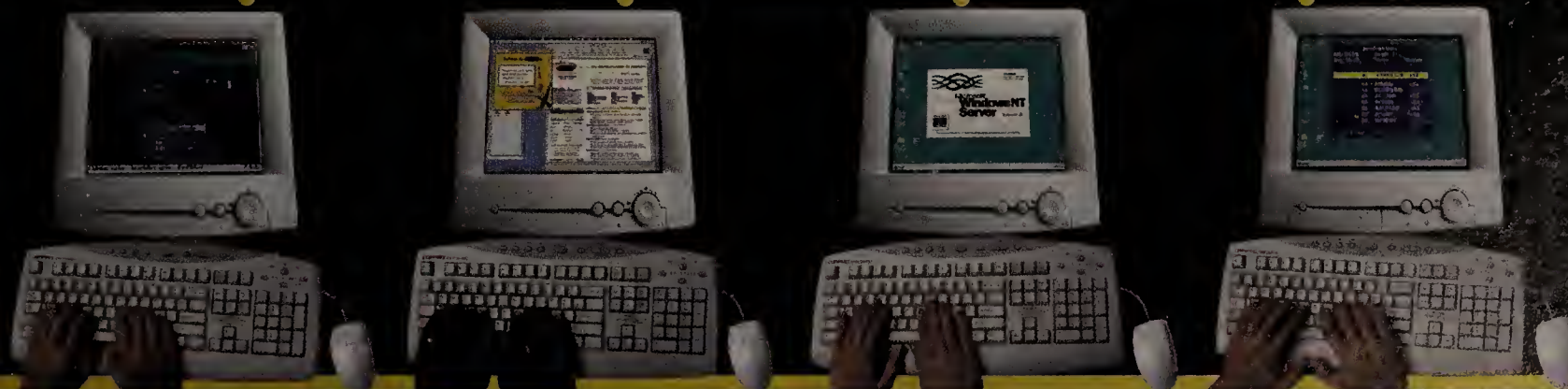
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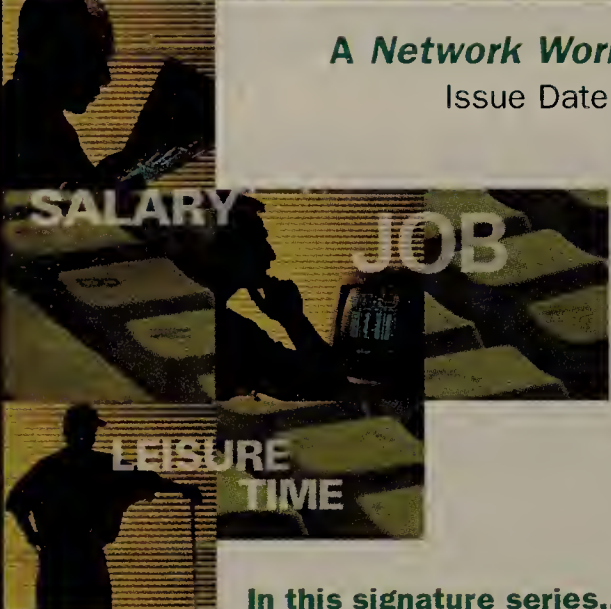
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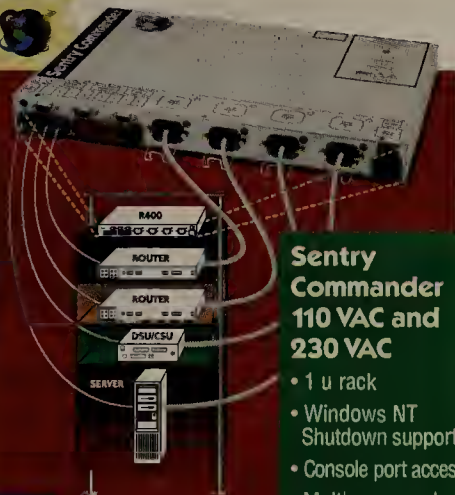


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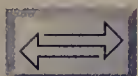
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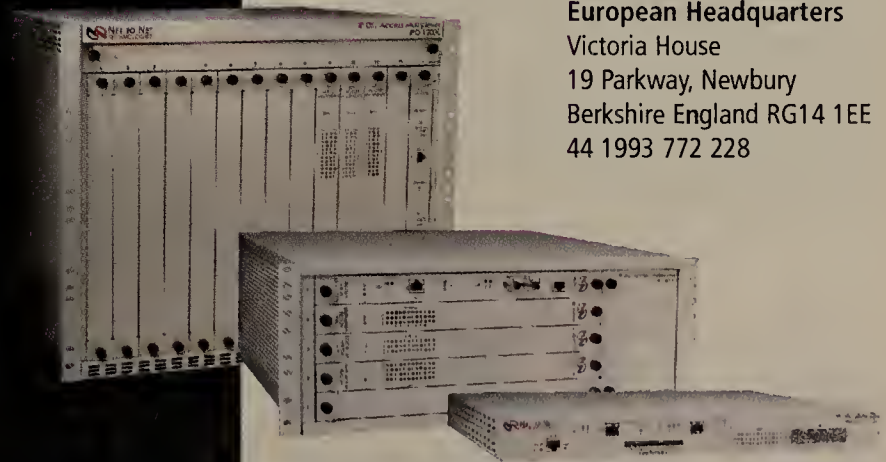
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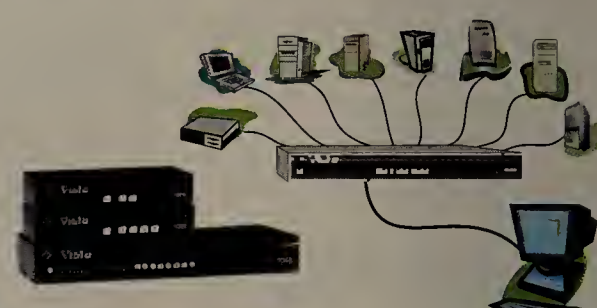
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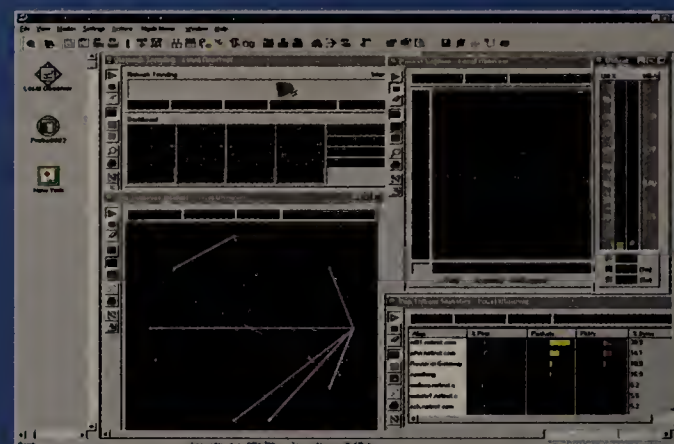
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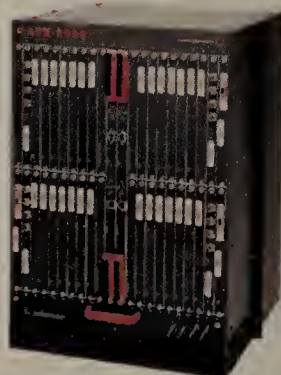
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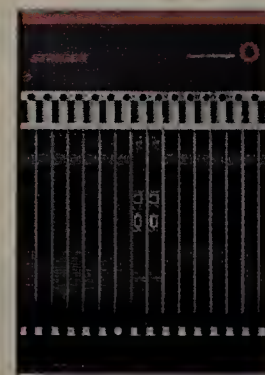
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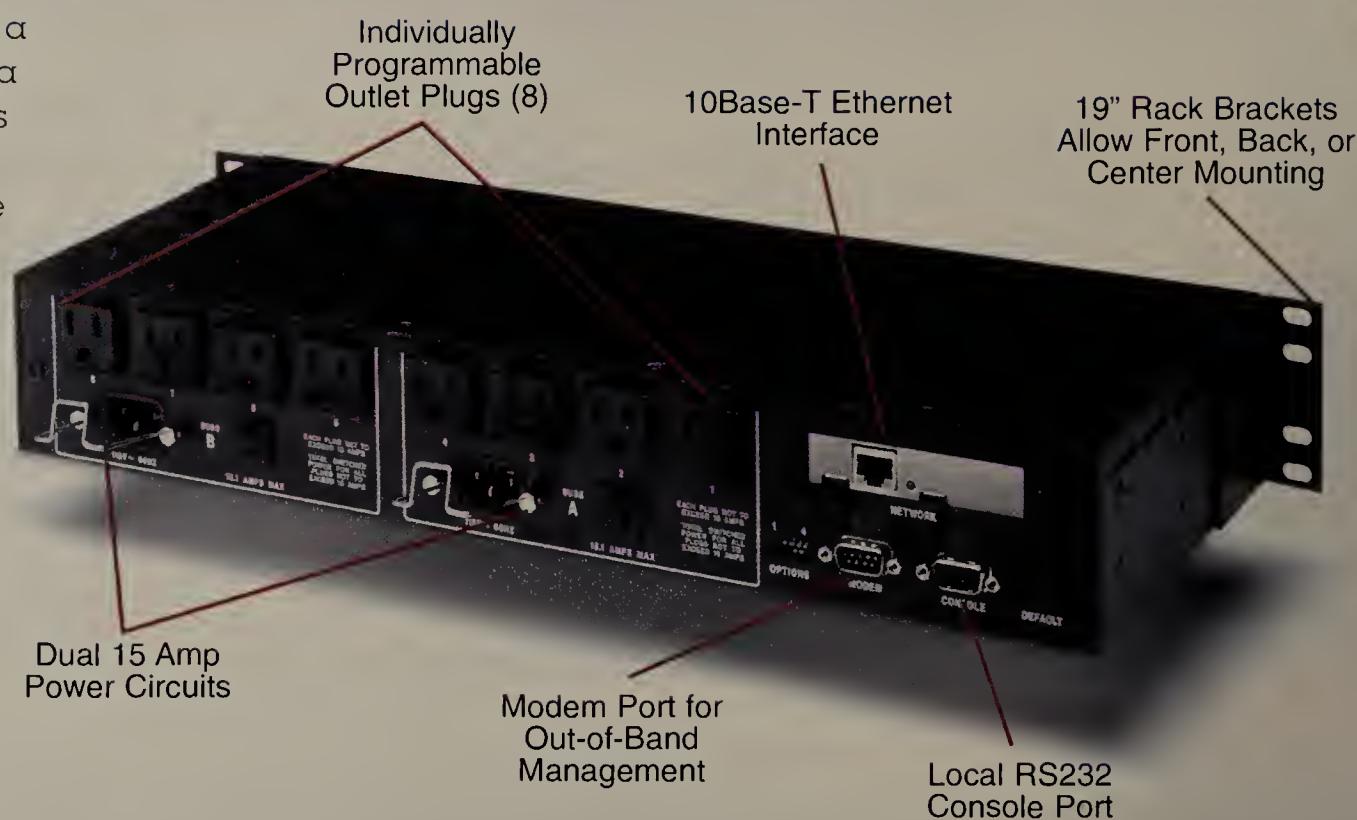


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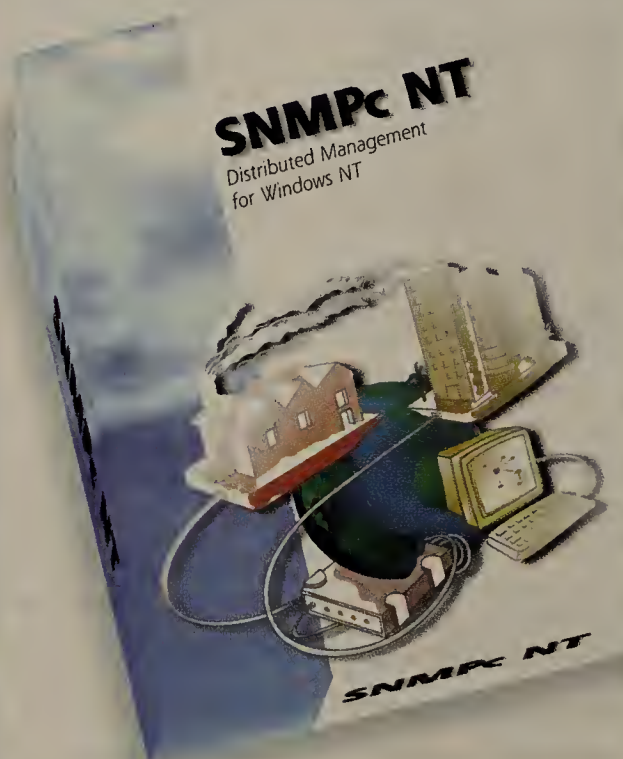
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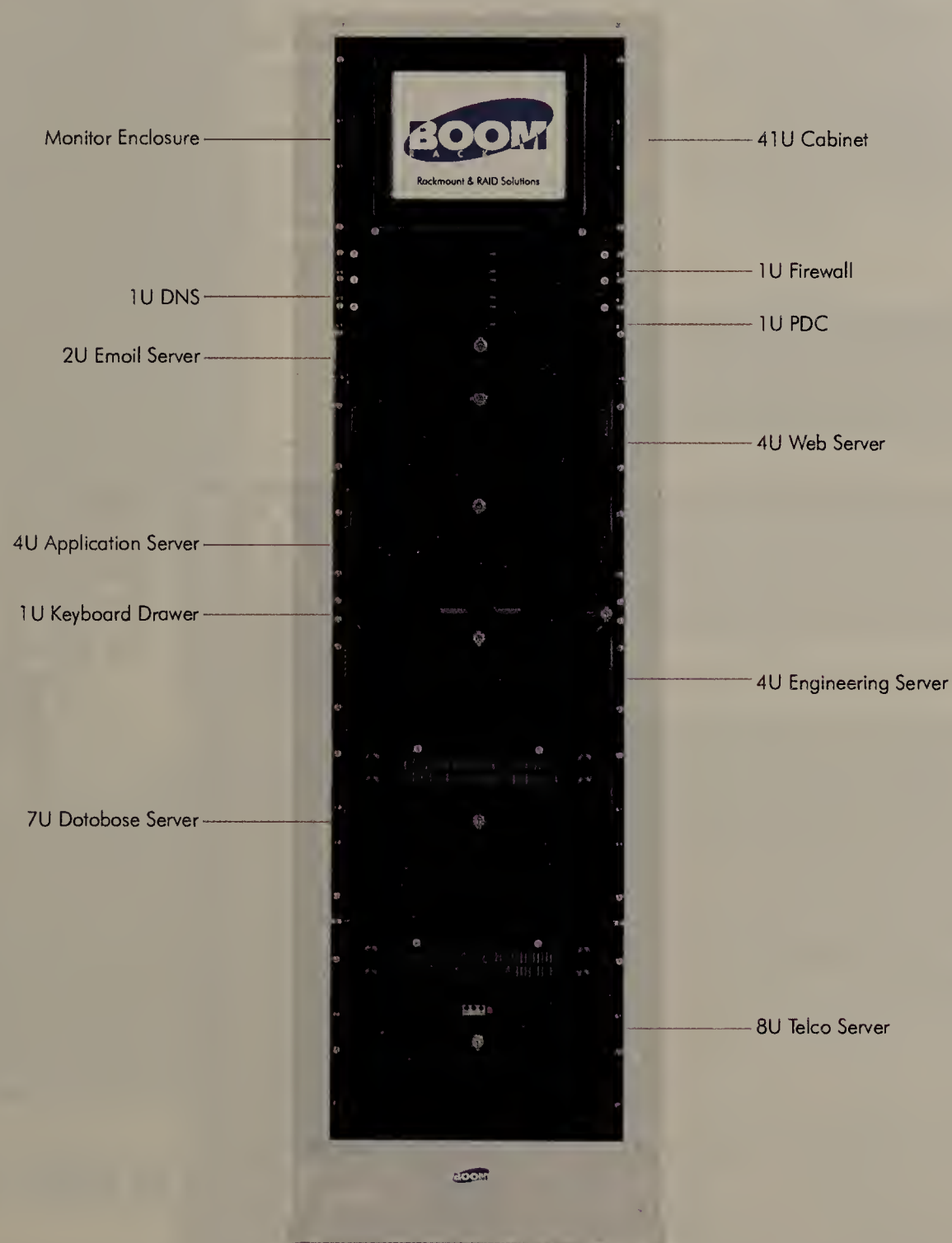
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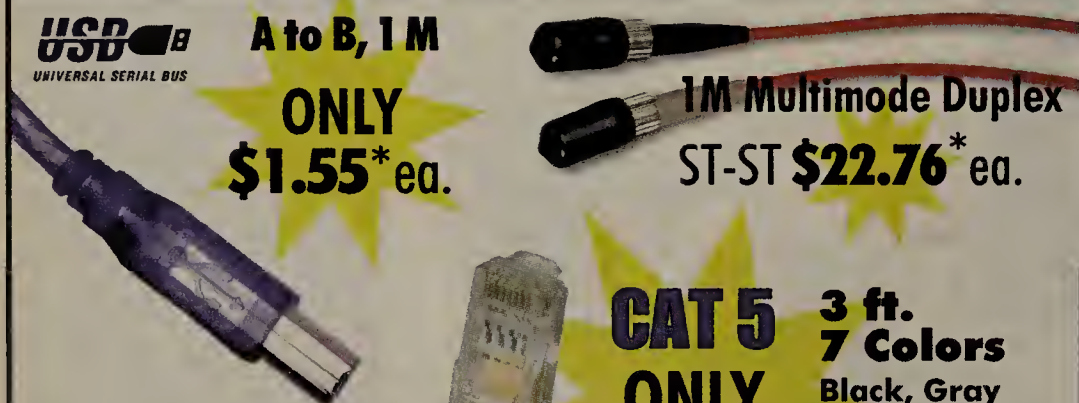
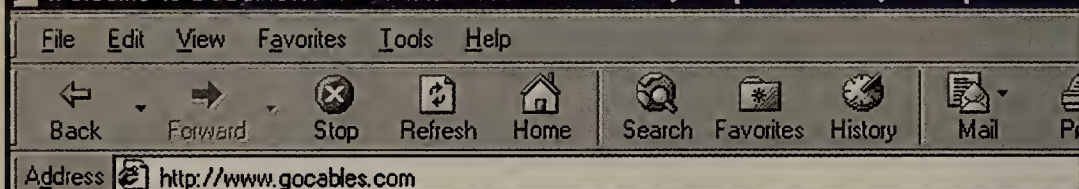
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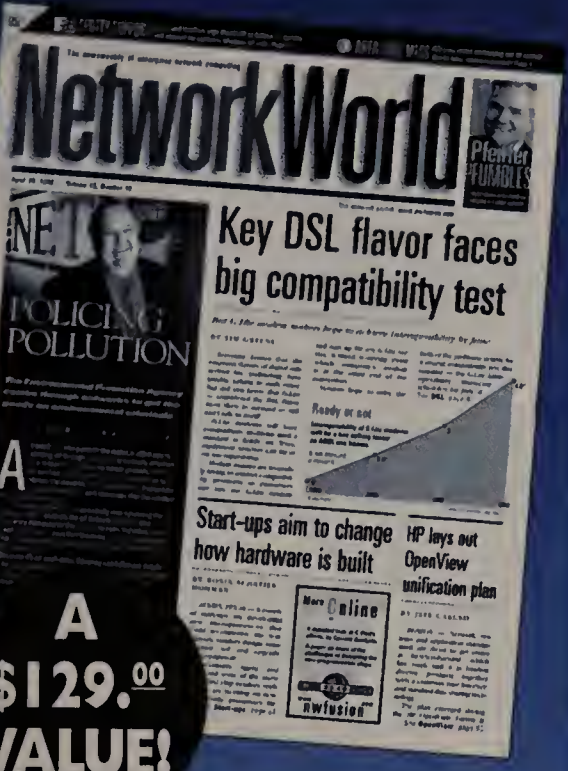
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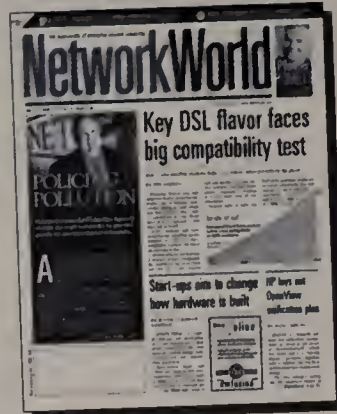
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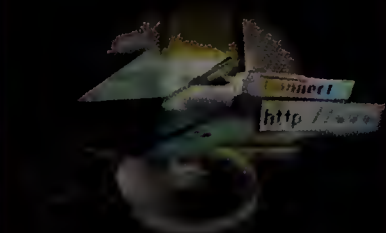
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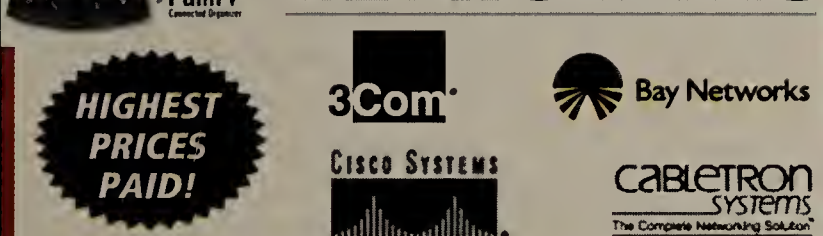
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Systems Engineer (Temple Terrace, FL). Analyze user requirements such as new or changed business requirements and provide conceptual solutions to satisfy them. Determines impact of proposed changes on system architecture during requirements definition phase and provides technical solutions to meet them within schedule. Design, analyze, estimate and implement service requests. Identify, recommend and document effective design methodologies and tools to be utilized during the design code test implementation, and installation phases using Visual Basic, MS SQL Server, Oracle, MS Access and Crystal Reports. Reqts: Bachelor's degree in Computer Science, Engineering or Math. Two yrs exp in the job offered or two yrs as a Systems Analyst. Two years of exp must include exp with programming with Visual Basic, M.S. Access and Oracle. 40 hrs per week. 8:30-5:00. \$51,600 per year. Send resume to Dept. of Labor/Bureau of Workforce Program Support, PO Box 10869, Tallahassee, FL 32302-0869. Re: JOFL# 2076999.

Programmer Analyst. \$63K/yr, 8a-5p, 40 hr/wk. Plan, dvlp, test & implemt comp prgm using prgmg techniques/analysis of systems & to review/alter prgms to automate & enhance operating capacity & adapt to new reqmts using VB 4(16-bit), Access 2.0, Crystal Reports, Sybase System 11, Foxpro, Unix, Unix Intervals, C, C++. Must have Bach or equiv w/major in Comp Sci or Engg or Technology. Exp reqmt: 18 mos work exp in job offd or in related occupation as Sysms/Prgrmr Analyst or Associate. The req'd 18 mos work exp in job offd or in related job must use prgmg & s/ware applics using VB 4(16 bit), Access 2.0, Crystal Reports, Sybase System 11, Foxpro, Unix, Unix Intervals, C, C++. Job loc: Lawrenceville, GA. Send 2 resumes or apply in person at: GWINNETT, JO # GA6511836, 1535 Atkinson Rd., Lawrenceville, GA 30043-5601 or the nearest Dept of Labor Field Svc Office. Must have proof of legal auth to work in US.

MBNA Hallmark Information Services, a subsidiary of a major national bank, is actively interviewing for a limited number of openings in its Distributed Operations department in Newark, Delaware.

#### SENIOR TECHNOLOGY ENGINEER

Must have Master's degree in computer science, math, engineering, or related discipline and four years of experience as a Senior Technology Engineer or in a software system development occupation. Must have experience with UNIX and NT systems, C++, Visual BASIC, Oracle, Sybase, CMVC, Informix, and Powerbuilder. Competitive salary and benefits package offered. Send resume, referencing code No. N06301576E, to MBNA 1100 N. King St., Wilmington, DE 19884-3638.

TechSolv, Inc, a NJ IT Co., is looking to fill up the following positions at their work sites at NJ:

Programmer Analyst - Bachelors degree in engineering (any), math, science and two years of experience in the job (or) five years of experience in the job. Must have experience in Sybase, Database, Unix.

ERP Consultant: Must have exp in the design, development, management and implementation of SAP, Financial Accounting, Materials Management, Oracle Financials, Unix, Windows NT, and MS-Access. Masters degree in engineering (any), math, science, with 2 yrs exp. (or) Bach in engineering (any), math, science w/5 yrs exp/ dsgn and dvlp, various software applications using above skills.

Send resumes to TechSolv, 60 #1 Mile Road, Orchard, Suite 137D, Cranberry, NJ 08512.

#### SR. SAP PROGRAMMER ANALYST

W.R. Grace & Co. is seeking a Senior SAP Programmer Analyst at its facilities in Cambridge, MA, to analyze, design and develop SAP R/3 ABAP/4 programs. Required to write SAP R/3 ABAP/4 programs from detailed specifications and designs, and develop and maintain Layout Sets (forms and SAPscripts). Perform research using SAP's Data Dictionary information systems. Apply and search application solutions using SAP's On-line Service System (OSS). Salary commensurate with experience. When applying for this position, please forward resume to W.R. Grace & Co., Attn: Tim McKeown, Manager, Comp & Expat. Management, 7500 Grace Drive, Columbia, Maryland 21044.

PROGRAMMER ANALYST. Analyze existing procedures and systems; convert to new systems; perform code, debugging and prepare documentation of developed modules; testing of modules; implement and input operational training to users on the developed modules. Salary: \$60,000 per year. Working hours: 40 hours per week, 8am-5pm. Min. required: Bachelor of Science or equiv. in a computer related field. Also required: college level course work or one year experience in ORACLE in UNIX environment, writing shell scripts such as BORNE SHELL, C SHELL, KROME and utilities like SED and AWK, Visual Basic, PowerBuilder, Oracle, SOL, PL/SOL, C Designer 2000, Developer 2000 and SOL Loader. Send two resumes to Gwinnet, Job Order #GA 6511091, 1535 Atkinson Rd, Lawrenceville GA 30043-5601 or nearest Dept of Labor Field Service Office.

Principal Software Engineer / Project Leader: Responsible for research into year 2000 problems on various software systems, and providing appropriate solutions. Research will consist of finding Y2K problems existing in the systems software and possible programming errors related to particular programming languages or environments, and developing general-purpose solutions. Also will organize and manage software professionals in the execution of identification and remediation projects. Will perform identification and remediation in complex problems on projects. Requires: Ph.D. in C.S., E.E. or related field. Also requires knowledge of C/C++, FORTRAN, and RDBMS including Oracle and Sybase and the X Window system. 40 hrs/wk (9 to 5); \$85,000/yr. Send two resumes/response to Case #19990923, Box 8968, Boston, MA 02114.

MBNA Hallmark Information Services, a subsidiary of a major national bank, is actively interviewing for a limited number of openings in its Distributed Operations department in Newark, Delaware.

#### SENIOR SOFTWARE ENGINEER

Must have a bachelor's degree in Computer Science, Math, Engineering, or related discipline and three years of experience as a Senior Software Engineer or in a software development occupation. Must have experience with Windows NT, SYBASE, SOL, Unix, C++, CMVC, XIPC, RDBMS, and Tuxedo.

Competitive salary and benefits package offered. Send resume, referencing code No. N63015706, to MBNA 1100 N. King St., Wilmington, DE 19884-3638.

ENGINEERING PROGRAMMER in Jacksonville, FL. Apply engineering background to convert engineering & other tech. problem formulations to a computer processable format. Apply extensive knowledge of comp sci & engineering to direct analyst-programmers in resolving problems of intent, inaccuracy, or feasibility of comp processing through analysis of user reqs, operational procedures, production & workflow needs. Direct analyst-programmers in the installation, implementation & modification of hardware & software. Must be willing to travel to client sites for assignments which vary in duration from several days to several yrs. Bachelor's degree in Comp Sci or equiv. 4 yrs exp in the job offered or as Software Engineer. 40 hrs/wk, 9a-5p, \$75,000/yr sal. Verif refs. Send resume to Workforce Program Support, PO Box 10869, Tallahassee, FL 32302-0869, JOFL#2079761.

Senior Software Engineer (Temple Terrace, FL) Design, research and develop telecommunications network management software systems using HP, UX, C/C++, knowledge of Telecommunication Network Management, CMIP-base telecommunication tool kit and object oriented database. Reqts: Master's degree in Computer Science, Information Technology of Engineering. Two years experience in job offered or two years as a Systems or Software Engineer. Two years experience must include experience with software development using HP UX, Operating Systems, C/C++, Telecommunications Network Management and object-oriented database. 40 hours per week. 8:30-5:00. \$68,000 per year. Send resume to Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, Florida 32302-0869. FLJO# 2083485.

Software Engineer, Malden, MA; Analyze, design, develop, test and implement the Financial/Database applications using Visual Basic, Oracle, MS Access, Crystal Reports and Magic on Windows and Unix environment. Use PVCS and SourceSafe to maintain Source Code Control Systems. Req'd. Masters' in Engg. or Comp. Scie. or Math. 1 \* yr. Exp. in job offered or 1 yr. exp. in a Related Computer Profession. \* Will accept Bachelors degree and 5 years of progressive work experience in lieu of masters and 1 yr. exp. 40 hrs/wk., 9a-6p., Mon-Fri., \$76,252.80/Year. Applicants should submit two (2) copies of resume in response to Case #19990932, P.O. Box 8968, Boston, MA 02114.

Full time Sr. Programmer Analyst to perform end user requirements study, systems analysis, systems design, coding, implementation documentation and maintenance support as required by the end user. Perform systems analysis and design support on application software using Developer 2000 on Client/Server Oracle based system. Design, develop, test and implement test software using Oracle. Must have a bachelor's degree in CS, any engineering discipline or related field (foreign degree equivalent accepted). Must have two years of experience in job offered or position with the same duties. Salary \$65,000. Send resume to: DataScan Technologies, 1105 Sanctuary Parkway, Suite 190, Alpharetta, Georgia 30004, Attn: Kimberly.

NYFIX, Inc, a Stamford, CT based developer of electronic trading systems, seeks Software Engineers w/strong C++ & SQL. MS in Comp Sci, Tech, Engg, Math or related field & min 2 yrs related exp.

Mail / Fax / Email resume to NYFIX, Inc, HR, 333 Ludlow St, Stamford, CT 06902. Fax: 203-425-8100, Email: jobs@nyfix.com

Systems Analyst wanted by IS/IT Consulting Services Co. in Woodbridge, NJ for client locs throughout US. Must have Bach in Comp Sc, Engg & 2 yrs s/ware exp.

Respond to: HR Dept., AVS Systems, Inc., 40 Enterprise Ave, Secaucus, NJ 07094. (Ref. #GG-6145)



Systems Analyst wanted by Info Tech Firm in Union, NJ. Must have degree in Comp Sci or equivalent interpreting COBOL Statements & rewrite in ORACLE & UNIX.

Respond to: HR Dept, Patel Consultants Corp, 1525 Morris Ave, Union, NJ 07083.

Programmer Analyst, Malden MA; Analyze, design, develop, test document and implement applications using Oracle Backend, Designer 2000, SQR Reporting Tool and SQL\*PLUS. Provide technical support. Req'd. Bachelors in Engg. or Comp.Sci. or Math. 2 yrs. exp. in job offered or 2 yrs. exp. in Computer Related profession. 40 hrs/wk., 9a-6p, Mon-Fri., \$70,000/Yr. Applicants should submit two (2) copies of his/her resume in response to: #19992562, P. O. Box 8968, Boston, MA 02114.

Software Engineer sought by Princeton, NJ Co. involved in Computer modeling of biological systems. Must have Masters in Biomed or Elec Engg, Comp Sci, Applied Math, Num Analysis & 1 yr exp dsngng, dvlpng, integrating, testing & debugging computer-based physiological systems analysis s/ware, using C++, Java & HTML.

Respond to: HR Dept., Physiome Sciences, Inc., 307 College Rd East, Princeton, NJ 08540-6608.

3D Animation Software Developer wanted by New York-based Maritime Education & Services Co. for job in New York City. Must have Masters in Comp Sci or Engg & 2 yrs related experience. Respond to: Brian Donohue, Director of R&D, The Seamen's Church Institute, 241 Water St, NY, NY 10038

Software Developer wanted by Tech Solutions Co in Norwood, MA. Must have BS in Electrical Engg & 1 yr s/ware exp.

Respond to: HR Dept, Manoj Saxena, ADZAP, Inc., 210 Neponset St, Norwood, MA 02062.

Data Base Administrator needed by Computer S/ware Consulting & Dvlpmnt Co. in Paramus, NJ for client locs throughout US. Must have Masters in Comp Sc, Engg & 2 yrs s/ware exp. Respond to: HR Dept., Indus Consultancy Services, 140 E. Ridgewood Ave, Paramus, NJ 07852.

Systems Engineer, Malden MA; Analyze, design and develop Smart Client/Thin Client Oracle Applications/Web Applications (ERP Software) using Designer/2000, AIMS, PL/SQL, SQL\*Plus, Discoverer, SMARTDB and SQL\*Loader for migration and conversion. Req'd. Masters \* in Engg or Comp.Sci. or Math. 1 \*yr. exp in job offered. \* Will accept Bachelors degree & 5 yrs. of progressive work exp. in lieu of Masters and 1 yr exp. 40 hrs/wk., 9a-6p, Mon-Fri., \$76,252/Yr. Applicants should submit two (2) copies of his/her resume in response to: Case #19992451, P.O. Box 8968, Boston, MA 02114.

Systems Analyst/Programmer wanted by Securities Firm & Discount Brokerage House in Jersey City, NJ. Must have Masters in Comp Sci, Math, Finance or Engg & 1 yr exp planning, dvlpng, analyzing & testing comp applics & prgms using UNIX, C++, Perl and Visual Basic. Respond by resume to: HR Dept., National Discount Brokers Group, Inc., 10 Exchange Place, 15th Flr, Jersey City, NJ 07302.

Network Engineer, Boston, MA; Implement and manage a Windows NT network in a Trading environment with a full suite of BackOffice Server Software, which includes Exchange, SMS and SQL Server. Manage the Wide Area Network and provide support in the UNIX environment. Req'd. Bachelors in Engg. or Comp. Sci. or Math. 2 yrs exp in job offered. 40 hrs/wk, 9am-6pm. Mon-Fri. \$85,000/Yr. Applicants should submit two (2) copies of his/her resume in response to: Case #19992439, P.O.Box 8968, Boston, MA 02114.

Senior Software Engineer wanted by On-line CD & Video Sales Co in Ft. Washington, PA. Must have BS or equiv in Comp Sci, Engg, Electronics, Physics or related field & 2 yrs exp dsngng, dvlpng new server & database technologies to support on-line retail operations. Respond to: Cheryl Jacobs, HR Manager, CDNow, Inc., 1005 Virginia Drive, Ft. Washington, PA 19034.

Computer System Engineer wanted by Pharmaceutical Co in Edison, NJ. Must have Bach in Comp Engg & 2 yrs engg exp dsngng RAS system, managing Oracle Database in SUN Solaris, maintenance & support for UNIX & NT systems.

Fax resumes to: 212-308-5325.

**Software Engineer**  
Design, develop and implement application systems in Windows environment. Develop software systems using Powerbuilder, Visual Basic, Sybase, Oracle, on LAN's under MS-Windows operating system. Design and implement software using C, C++, and analyze and determine user requirements. B.S. (comp sci, eng. rel field/equiv) and 5 yrs. exp. 40 hrs/wk. Send resume to: Human Resources, 128 Software, Inc., 44 Wood Avenue, Suite 1, Mansfield, MA 02048.

Database Administrator, Boston, MA; Perform data modelling, provide support for Oracle Database to insure availability, performance and data integrity. Manage new database tables. Develop applications using Visual Basic, MS Access, C on Windows, DOS and Windows NT. Req'd. Bachelors in Comp. Sci or Engg. or Math. 1 yr exp. in job offered or 1 yr. exp in Computer Related Profession. 40 hrs/wk., 9a-6p. \$43,000/Yr. Applicants should submit two (2) copies of his/her resume in response to: #19992445, P. O. Box 8968, Boston, MA 02114.

Programmer Analyst: Atlanta (GA); Design, develop & test applications in finance and accounting areas in client server environment using Sybase, PowerBuilder, C and C++ on UNIX and Windows platforms; Requires BS in Computer Sc/ Elec Engg. & 2 yrs exp in Sybase and PowerBuilder using C and C++ under UNIX and Windows platforms; Salary \$60K/yr; 40hrs/wk (Mon-Fri) 8am-5pm; Apply in person or send two resumes to: Georgia Department of Labor, Job Order # GA 6513862, 2943 N. Druid Hills Road, Atlanta, GA 30329, or the nearest Department of Labor Field Service Office. Must have proof of legal authority to work in the U.S.

Systems Analyst sought by Software Consulting Co. in Iselin, NJ for client locs throughout US. Must have Bach in Comp Sc, Engg & 1 1/2 yrs s/ware exp.

Respond to: HR Dept., MJ Technologies of New Jersey, 762 Green St, Ste #2C, Iselin, NJ 08830. Ref. # GG 6623IM

Full time Systems Engineer responsible for analyzing software requirements for the company and the company's clients, using C/C++, Delphi, TCP/IP, systems software and user software specification-writing and coding. Must have a Master's degree in Electronics Engineering or foreign degree equivalent accepted. Must have 2 years of experience in the job offered or a position with same duties. Salary: \$77,430.00. Send resumes to: Karla Del Rio at Marconi Online Inc., 120 Interstate North Parkway, Suite 118, Atlanta, Georgia 30339.

Several positions available, including Software Engineers and Sr. Software Engineers in a variety of areas. Requirements and salary vary per position. Send resume to: Nanda Chheda, American Megatrends, Inc., 6145F Northbelt Parkway, Norcross, Georgia 30071.

Coats NA seeks Programmer/Analysts, Developers and DBAs to support Client/Server applications. B.Sc. Computer Sc. or related + exp. with WinNT and Oracle tools & applications required. Send resumes to Coats North American, 4135 So. Stream Blvd., Charlotte, NC 28217.

Coats is an EEO employer.

**PROJECT DIRECTOR**  
Stoneham, MA: Project Director with proven track record in remote management of teams & projects. Design & implement web-based applications using VB, VC++, MTS, ATL, COM/DCOM, IIS, ASP in Win/NT environment. Candidates with Masters degree in tech related field & min 2 years industry experience in Proj Mgmt or DB Admn preferred. Fax resume with salary history to 781-438-7730 or email michelene@planetsoft.com

Programmer/Analyst wanted by Computer Services Co in Edison, NJ. Must have Bach in Comp Sci, Comp Engg or Elec Engg & 1 yr exp planning, dvlpng & testing & documenting comp s/ware under client server architecture using C/C++, SOL & PL/SQL with ORACLE & MS SQL Server databases in Win & UNIX envrmt. Respond to: HR Dept, Information Technology Management, 900 C Oak Tree Rd, Edison, NJ 07080.

**Software Engineer**  
We are seeking 5 qualified candidates to develop state-of-the-art financial trading systems for institutional investors. Utilize knowledge of PERL, UNIX, & Oracle, in improving software by modifying existing features or adding new ones to enhance efficiency. Design, dvlp & implement based-financial systems supplying leading edge tools for real-time data, stocks & options analysis, charting, portfolio analysis & trading operations. Req'd: Bach. degree in Comp. Sci., Engng or Math & 3 yrs of exp. in related field. Pls mail resume to IT Web, 410 Eighth St., 3rd fl., Hoboken, NJ 07030 or fax to 503 905 0277 Attn: Mr. Hesh. No calls, please.

Systems Analyst wanted by Co dvlpng & mktg banking s/ware in Miami, FL. Must have 4 yrs exp.

Send resumes to: HR Dept, Datapro, Inc., 1300 Brickell Bay Dr, Miami, FL 33131.

Multiple openings available! - Intervolve Inc. is looking for candidates possessing MS/BS or equivalent and relevant experience. Work with several of the following in web application development: Visual Basic, ASP, SQL Server, and MTS. Experience with Solaris, Linux, PHP/Perl preferred. Please e-mail responses to [hr@intervolve.com](mailto:hr@intervolve.com)

Software Engineer - design, development and deployment of e-business systems over the internet, using OOPs technology, Java applications, and RDBMS databases (SQL Server/Oracle). BS/MS with relevant experience. Send resume to: ShareMax.com, HR Dept, 1259 Rt. 46 East, Parsippany, NJ 07054.

Database Administrator, Stoneham, MA; Analyze, design and develop applications on Unix and Windows NT Operating System using Oracle RDBMS, Pro\*C, Cobol, Clipper and FoxPro. Perform Novell Netware and Oracle database administration tasks. Req'd. Masters\* in Comp.Sci. or Math or Engg. 1 yr. exp in job offered or 1 yr exp. as Oracle Developer. \*Will accept Bachelors degree & 5 yrs. exp. in lieu of Masters. 40 hrs/wk., 9a-6p, Mon-Fri., \$60,000/Yr. Applicants should submit two (2) copies of his/her resume in response to: # 19992510, P. O. Box 8968, Boston, MA 02114.

**SOFTWARE ENG** Design, develop & implement new computer processes & procedures to enhance revenue collection process (systems mods, enhancements, mgmt reporting). B.S. Computer Science or equiv + 2 yrs exp as Programmer/Analyst or Software Eng reqd. Exp w/ FOXPro, C, SOL, UNIX, MS Access, Excel & Word also reqd. \$78K/yr. Send resume to: H.R.Mgr., Premiere Technologies, Inc., 3399 Peachtree Rd, N.E., Ste 600, Atlanta, GA 30026, Ref #ED1.

Sr. Programmer Analyst - Develop migration strategy for software projects using Progress & shell scripts on UNIX based hardware. Reqs: 2 years 6 months experience. Employer is a computer consulting company. Relocation required to client sites for assignments from 6 months to 2 years. M-F, 9AM - 5PM, 35 hrs./wk., \$82,000/yr. Send 2 resumes to: Case #19992465, PO Box 89688, Boston, MA 02114.

Database Administrator, Malden, MA; Perform, install, upgrade and maintain Oracle Databases, Oracle Applications and tools Developer 2000, Designer 2000 and OEM on UNIX and Windows NT. Prepare Oracle Database Tuning, Performance Monitoring, Back up and applications tuning. Provide technical support in Oracle Financials and Oracle manufacturing Modules; use Forms 4.5 and Reports. Req'd. Masters in Comp. Sci. or Engg. or Math. 1 yr. exp. in job offered 40 hrs/wk., 9a-6p. \$75,000.00/Yr. Applicants should submit two (2) copies of resume in response to: Case #19992496, PO Box 8968, Boston, MA 02114.

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#### Senior Software Engineer -

East Haven, CT. Require experience in design and development of commercial software using Visual Basic and SQL Server. Attractive compensation package. Send resume to Karan Myers, Professional Pensions Inc. 444 Foxon Road, East Haven, CT. 06513.

Programmer Analyst - design and implement web pages, server side scripting, using OOPs technology, Java applications and RDBMS database (SQL Server/Oracle). BS with relevant experience. Send resume to: ShareMax.com, HR Dept., 1259 Rt. 46 East, Parsippany, NJ 07054.

Sr. Engineer - Network Operations Center wanted by Telecom Services Co in Hackensack, NJ. Must have BS in Comp Sci, Electronics or Engg, 3 yrs. exp. utilizing WAN equipment and processes & 1 yr exp with OSPF, BGP, IS-IS and Internet routing protocols.

Respond to: HR Dept, Net2Phone, Inc., 171 Main St, Hackensack, NJ 07601.

Programmer/Analyst wanted by Computer Services Co. in Rochelle Pk, NJ. Must have Bach in Comp Sci, Comp Engg or Elec. Engg & 1 yr exp planning, dvlpng, testing & documenting computer s/ware for ERP applic using BPCS s/ware.

Respond by resume to: HR Dept, JGI, 201 West Passaic St, Rochelle Pk, NJ 07662.

Software Engineer, Malden, MA; Analyze, design and develop client-server applications using SYBASE, DB-Lib/C, ISOL, SQR and SYB-Perl on HP-UX. Provide technical support. Req'd. Masters in Comp. Sci. or Engg. or Math. 1 yr. exp. in job offered. 40 hrs/wk., 9a-6p. \$76,252.80.00/Yr. Applicants should submit two (2) copies of resume in response to: Case #19992440, PO Box 8968, Boston, MA 02114.

Software Engineer wanted by Software Consulting Co. in Princeton, NJ to analyze, design, develop, test and implement internet/intranet applications using C++, Visual C++, COM/DCOM, ActiveX, ASP and JAVA. MS in Comp Sci or Engg reqd. Only experienced candidates need apply. Respond by resume: HR Dept, Ref #2001, Princetec Inc, 4365 Route 1S, Princeton, NJ 08540.

Professional Services Consultant sought by Massachusetts-based S/ware Dvlpmnt & Consulting Co. for job in New York City. Must have Bach in Comp Sci, Comp Engg or related field & 1 yr IT consulting experience.

Respond to: HR Dept, Job Code #5620, Cognos Corporation, 67 South Bedford St, Burlington, MA 01803.

**SENIOR SOFTWARE ENGINEER**  
with 2 years of computer-related experience to design, develop and implement software applications using Oracle, Developer 2000, SQL, and Unix. Excellent communications skills and a Master's degree or equivalent required. FAX resume to HR 7819374976 or email: [tbetti@raymondkarsan.com](mailto:tbetti@raymondkarsan.com)

Systems/Programmer Analysts: Several Sr. and entry level positions available for qualified candidates possessing BS/MS or equivalent and relevant work experience. Work with some of the following DB2, CICS, COBOL and VisualAge Generator V3.1. Must be willing to travel and relocate as required. E-mail resume to [saniay@stellarsoft.com](mailto:saniay@stellarsoft.com)



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President of LeadersOnline,  
on what it takes  
to be a leader.**



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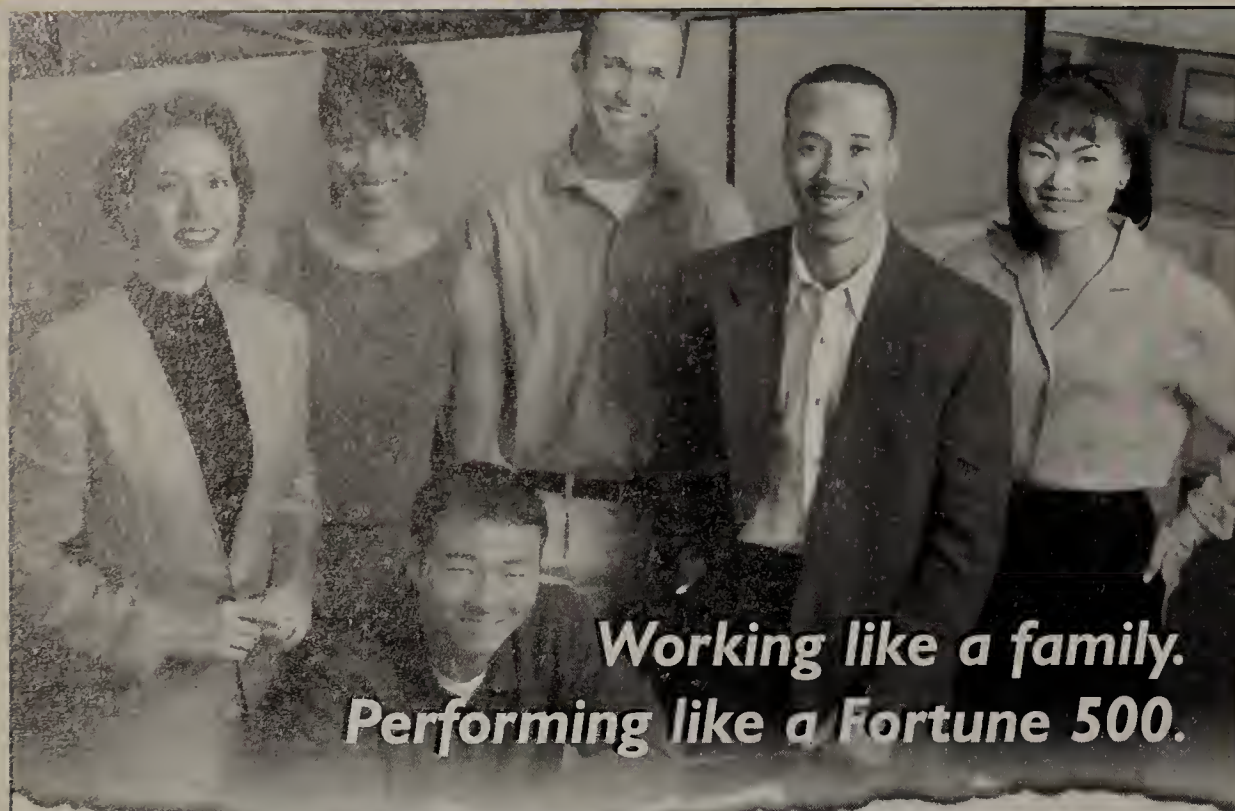
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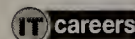
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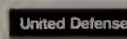
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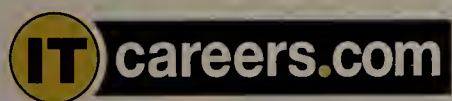
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## Cap Gemini LLC Clark, NJ

Cap Gemini Group is part of the larger international firm, Cap Gemini LLC, which is in the midst of acquiring consulting firm Ernst & Young. Cap Gemini's Dan Abruscato, director of recruiting and resource allocation, says one of the biggest challenges the firm faces in 2000 is hiring the best and brightest. "We're a much broader organization today," he says, "supporting mobile Internet, DSL, broadband and wireless communication."

Abruscato believes the industry is changing more now than ever before. "There are major changes in the industry the likes of which we've never seen," he says, "and it's due to the growth of package switch technologies. Wireline telephony is converging with wireless technology and a set of underlying technologies that can carry voice, data, messages and video. We're managing existing systems and weaving new services into the mix."

"We are looking to add and train a tremendous number of people by year-end," says Abruscato. "We need Java and Corba skills, a history with telecommunications and subject matter experts." Abruscato also looks for people who have backgrounds in carrier-to-carrier interconnectivity, gateway interfaces and business operations, such as billing and support. "Because the technology is so evolutionary, we need people who have project life-cycle experience, everything from analysis to development to implementation. And, we look for people who understand customer relationships and change – people who can create both."

Cap Gemini has training and development centers in Morristown and Clark, NJ, as well as Cleveland, OH. The company recently

launched a major cross-training and skill-development initiative, known as New Wave. Fifteen people each week are cross-trained into new product areas. "You will have the autonomy to seek your own skill interests, and our commitment is to support the evolution of new technology," Abruscato adds. "We offer excellent projects in web-based solutions, and these are projects that typically last six months to a year, so you will have the opportunity to move on to something new."

"Another real plus for Cap Gemini is that IT professionals will have the opportunity to see different telecom environments around the globe," says Abruscato. "Europe is ahead of the United States in terms of wireless, so it's a great place to learn. You'll learn and see what other countries are doing."

## DSL.net New Haven, CT

DSL is the most familiar name in Internet connectivity speed. What few people know is that DSL.net is a small start-up company with approximately 400 employees and plans to hire more than 600 this year.

Quinn Hedrick, manager of corporate recruiting, says the company assists customers with high-speed Internet access at flat rates, but it also does more: web hosting, remote LAN access or corpo-

rate network access, high-speed access to Internet-based video, virtual private networks, enhanced e-mail and e-commerce. "We offer a suite of services designed to enhance the use of the Internet," says Hedrick. "Once we wire our service to your business, we also monitor your connection and speed to make sure you are getting the best service."

**"The best part of working in this environment is that it is dynamic. The online industry is where the most business activity is centered, and this is the backbone of that online world."**

**Quinn Hedrick**  
Manager of corporate recruiting  
DSL.net

"The best part of working in this environment is that it is dynamic. The online industry is where the most business activity is centered, and this is the backbone of that online world," says Hedrick. "You'll be able to move around, from project to project, to gain experience. We provide training and experience to fill any skill voids. The energy level is high, and you'll be surrounded by a lot of talent and skill."

The DSL.net IT organization is focusing on the company's operations, assuring that the service operates 24-by-7. "Continuously developing this network translates into major IT projects in networking software, architecture and back-end business operation application development," explains Hedrick. "We need people with a telecommunications background or who have worked with an ISP provider. The jobs are everything from network administration to help desk support to application development and implementation."



## Evoke Internet Communications Louisville, CO

Voice communications is the tip of the iceberg in the communication industry, according to Evoke Internet Communications. The idea behind Evoke Internet Communications is to use the Internet to expand and enhance communication for businesses. Evoke Internet Communications is an Internet communication service provider. The company creates reliable and flexible ways to communicate by combining the phone and Internet.

The company is focused on new-generation communication – the exchange of voice, video and visuals over the Internet. “We focus on helping businesses use these new capabilities,” says Paul Berberian, CEO of Evoke. “We offer a suite of services that target different applications, whether it’s a meeting or distribution of content through web casting, or talking e-mail.

“What we’ve found most challenging is that the Internet market has many niche players – we’re spanning across the market to offer an integrated package of services. Bringing together the services is very powerful,” says Berberian. “Our software engineers are building cool communication experiences that combine technologies and let technology disappear behind the scenes.”

Those who work at Evoke Internet Communications are playing in a large field of opportunities. Developers are working in wireless telephony, voice, streaming, online collaboration and high bandwidth applications. “We need people who are broadly skilled – decathlon people who can jump in and work in multiple problem sets,” Berberian says. “We must build in reliability and scalability so that we can offer an industrial strength service.

“We also need people who are open to a variety of technologies – who use what’s best to meet a customer’s needs,” he adds. “We need people who are willing to investigate and research to find that best solution.

“The best part is that you get real-time feedback and the satisfaction of seeing your work used and embraced,” Berberian says. “That’s what keeps people here – that and the fact that we’re constantly giving birth to new ideas and services.”

## Global Crossing Ltd. Rochester, NY

By now the position of Global Crossing is well known. The one-time transoceanic fiber carrier is building a network of 200,000 fiber optic miles, linking five continents and forming the infrastructure for worldwide communication. It’s reason enough for the company to claim some of the best talent in the communications industry. “We deploy global networks with very hot technology,” says Laura Ponticello, director of corporate and technical staffing.

Among the company’s top goals is to offer seamless end-to-end connectivity from Paris to New York, on to Tokyo. “With the network in place, we will offer customers a diverse array of products,” Ponticello says. “On tier with these two goals is that we have an employee population with diverse talents to fuel our growth worldwide.”

In addition to the major initiative in deploying the fiber-optic network, Global Crossing is rolling out an SAP implementation that will touch finance, payroll and human resources. The internal project is critical as the company continues its growth march. “We also are focused on product development,” says Ponticello,



pointing to projects in voice-over-IP technology, software and hardware. “We need engineers with network design or UNIX experience, software engineers, systems analysts and network architecture designers.”

The company has an aggressive college recruiting effort to hire network engineers. Once on board at Global Crossing, employees receive 100 percent tuition reimbursement for degrees up to a Ph.D. “And you can choose between technical and management career paths,” Ponticello adds.

In examining resumes, Ponticello looks for people with intern or work experiences and degrees in computer science or electrical engineering. For more experienced hires, she is looking for people with three to five years experience in a communications or software company. “We also need people with excellent interpersonal skills, who can deal with the customer at all levels, and someone who has spirit.”

The company offers locations in Rochester; Morristown, NJ; Beverly Hills; Detroit; Sunnyvale, CA; London; and Amsterdam.

## Riverstone Networks, Inc. Santa Clara, CA

In just over six months Riverstone Networks has grown from an idea to more than 300 employees. The company provides infrastructure solutions for metro area networks, and its customers include Internet providers, application service providers and content service providers. The list includes British Telephone, MCI Worldcom, Telefonica and Earthlink.

“Our products are Internet routers, application-aware switch routers, intelligent load balancers, web cache redirectors and software tools for provisioning, billing, monitoring, and managing service level agreements. Our products enable rapid deployment of high speed service rich infrastructure,” explains Andrew Feldman, vice president of corporate marketing and corporate development.

The company is searching for engineers with four to five years of experience in hardware or software design. “We need top caliber people who are seeking to work with an extraordinary team and who are willing to commit the energy and time required in a high profile start-up,” says Feldman.

While the company is young, Riverstone can boast of a highly experienced management team. “Our management team is proven,” says Feldman, “and they led such companies as Yago and Cabeltron.”

“It’s an exciting space to be in. Unlike many start-ups we have a revenue stream measured in the tens of millions already,” he adds. “The colleagues you’ll work with at Riverstone are unparalleled. If you are seeking to work on best of breed technology, while working with truly phenomenal colleagues, then you should consider Riverstone Networks.”

## SBC San Antonio, TX

Through its subsidiary brands (Southwestern Bell, Ameritech, Pacific Bell, SBC Telecom, Nevada Bell, SNET and Cellular One) and world-class network, SBC provides local and long distance phone service, wireless and data communications, paging, high-speed Internet access and messaging, cable and satellite television, security services and telecommunications equipment, as well as directory advertising and publishing. Internationally, SBC has telecommunications investment in 22 countries. With more than 208,000 employees, SBC is the 13th largest employer in the United States.

**“It’s an exciting space to be in. Unlike many start-ups we have a revenue stream measured in the tens of millions already. The colleagues you’ll work with at Riverstone are unparalleled.”**

**Andrew Feldman**  
Vice president of  
corporate marketing and corporate development  
RiverStone Networks, Inc.

SBC’s growth strategy is focused on initiatives in data services, wireless services, long distance and national expansion. Most can’t be accomplished without a software system or billing capability that’s ready when the company wants to go to the marketplace. It’s the job of SBC’s information technology organization to provide a competitive advantage to the corporate business units by delivering the systems and capabilities needed to achieve their operational goals. At the same time, IT makes sure existing systems run smoothly and efficiently for the benefit of the company’s customers and employees.

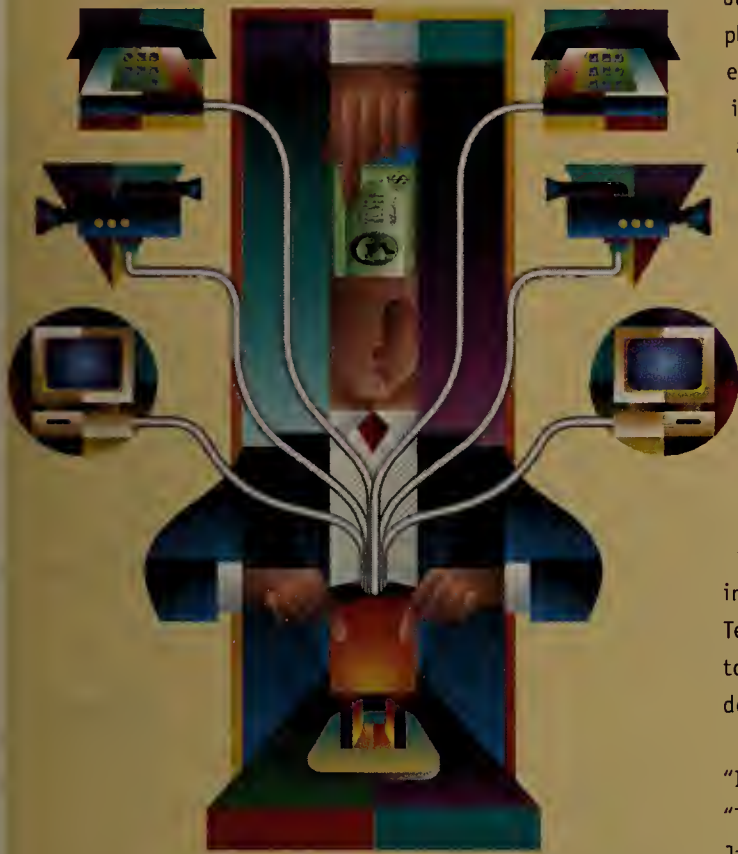
“SBC has approximately 17,000 employees working in the IT organization,” says Renee Schneider, executive director of information technology management staffing and contractor acquisition, “with key population centers in St. Louis, San Ramon (CA), Chicago, Dallas, Houston, New Haven, San Diego, Sacramento and Troy (MI).

“We’re a state-of-the-art organization,” continues Schneider, “with responsibility for all enterprise software solutions, data center operations, desktop and other infrastructure issues, and IT



functions for SBC's wireless, long distance, and directory operations. While SBC is looking for relational database, software and system developers, the focus is on people with strong IT skills who are excited about working in data, web or telephony, the more skill sets, the more versatile the assignments."

SBC offers both managerial and technical career paths. "More and more we're looking for business skills because of our need to closely align with our business units," says Schneider. "We're a company that has been built on internal promotion. If you are doing a good job, we will let you try something entirely new — and train you in the skills that will help you succeed. We know that people change employers when they're no longer challenged, so we work with you to provide new challenges within the same company."



"When all is said and done," says Schneider, "the right job is about enjoying what you do. People here enjoy their work and the critical role we play in the success of SBC."

## Sprint Kansas City, MO

While Sprint is destined to take on the name Worldcom later this year, the company continues to build its IT presence at the Kansas City location. According to Ric Walter, assistant vice president for human resources, Sprint's IT organization develops, implements and maintains services for the long-distance network.

Among the top IT projects is Sprint ION, an integrated on-demand network. "Basically, Sprint ION takes broadband into the home," explains Walter. "We are looking to the IT professionals to help us with software to program, to support billing and to support all aspects of the business infrastructure."

Sprint has a robust college-recruiting program that brings in 300 computer science graduates each year. After completing training specific to Sprint platforms and systems, they are then assigned to a wide range of projects. In reviewing applications, Walter looks for a strong educational background, demonstration of diverse experiences and the ability to be a contributor or leader on successful projects. The company seeks employees for electrical engineering, computer science, desktop support, programming, systems engineering and network design.

"We continue to support ongoing learning through formal classroom settings and computer-based programs," says Walter. "We do have a formal career path effort to make sure that people get the experiences they need to be happy in their careers. With the merger with Worldcom, you'll be able to take your career any place."

Walter says one of the most attractive aspects of Sprint is that it is viewed as an innovator in the telecommunications industry. "From the first fiber-optic network to Sprint ION, innovation has been the underpinning of our organization," he says. "Sprint PCS was launched using leading-edge technologies. We frequently are the company that is out in front, because that's the only way to stay on top of the market."

Just as important, Walter believes, is the environment in which people work. "You'll be working with your friends at Sprint. We offer an environment that's conducive to your personal growth and what's important to you. We offer a challenging work environment, but we also offer flexible work schedules and encourage employees to get involved with their communities. We want people to do those things away from work that keep them sharp."

## Tellabs, Inc. Warrenville, IL

As with many telecommunications companies, the shift to e-commerce and an e-world is all new for Tellabs, Inc. "We have always designed, developed and produced telecommunications equipment," says Debbie Toms, senior technical recruiter at Tellabs. The company is now extending its operations as the infrastructure builder of the industry. By partnering with communication service providers around the world, Tellabs is developing products and services that allow customers to offer new revenue-generating services while driving down costs.

"In the past we hired mostly electrical engineers," says Toms. "Today we're looking for people who have skills in HTML and Java. The objective is to move us ahead in e-commerce, focusing on electronic transactions. We use SAP as the backbone of our business operations in a client/server environment. Now we need web-enabled applications, systems and networking."

Listed among *Fortune Magazine's* "100 Best Companies to Work for in America", Tellabs hires approximately 40 percent of its employees based on employee referrals. In 1999, 89 percent of employees said they would recommend the company to friends and family seeking employment. "That is quite a statement about Tellabs," says Toms. "About 50 percent of our positions are filled by people from within the company."

The company continues to focus on people as its strength. In developing the new company headquarters building in Napierville, IL, the design includes health facilities run by a professional health fitness firm and onsite daycare. A group known as DreamQuest is dedicated to working with each employee on long-term goals and how the company can support individuals in terms of job opportunities and ongoing learning.

Tellabs has major development sites in Denmark, Finland and Ireland. "We focus on people being excited about their work versus being stressed," adds Toms. "You can tell the difference when you walk in — the undertow is one of excitement and staying on top."

## VoiceStream Wireless Corp. Bellevue, WA

In less than a decade, VoiceStream Wireless has grown to provide wireless phone service in 23 of the 25 major markets in the United States. It's part of the continued national expansion of the company. A portion of the growth has come from mergers and acquisitions. This year, VoiceStream is combining its assets with those of Omnipoint and Aerial to serve more than 1.8 million customers.

And that's presenting an internal and external challenge for VoiceStream's IT professionals. Julie Pollard, vice president of customer operations and systems, says among the first initiatives is assuring that seven different call centers offer the same service to customers and the company has a common platform to support all facets of the business. "We're responsible for these initiatives, along with many others up to and including the integration of web services with the wireless world," she says.

Pollard's organization is the IT hub, while distinctly not including information technology in its name. "We're the framework for the company, and we're involved in everything from combining three large companies on to a consistent platform to developing services," she says. "As the backbone of overall services delivery, we have a business objective beyond a specific technology."

"The fundamental is that this company has to be constantly available and ready for change. In IT that means that we must avoid restrictive standards and instead offer guidelines that allow us to be incredibly flexible. The technology is going to change, therefore, we have to be ready to change as well."

Pollard plans to hire about 100 IT professionals in the coming months. "Strong technical skills are a given," she says. "It's more difficult to find someone who has that entrepreneurial aptitude, who looks for opportunities to make change. These are the kinds of people we take in a heartbeat over those who may have more experience but not the characteristics. We look for people who have shown a consistent pattern within their careers for finding new opportunities and challenges within the same company."

According to Pollard, VoiceStream offers technical challenges ranging from call center to billing, product development to web-enablement. "We look for people who may have core competencies but who have a desire to broaden and stretch to other areas," she says. "I don't think there is another company that offers the number of technical opportunities that we can."

The company offers a casual environment that is about more than merely clothing, according to Pollard. "We avoid rigid structure. You make decisions. You make things happen. That's the best training ground you can get."

**For more job opportunities with communications companies, turn to the pages of IT Careers.**

## Interested in IT Careers?

**If you'd like to take part in an upcoming IT Careers feature, contact Janis Crowley, 650.312.0607 or [janis\\_crowley@itcareers.net](mailto:janis_crowley@itcareers.net).**

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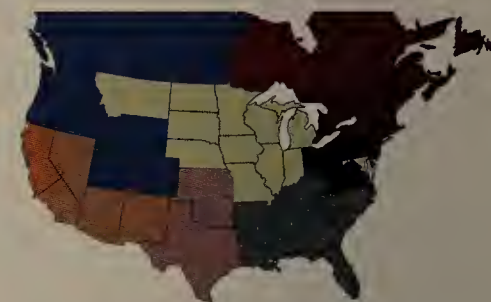
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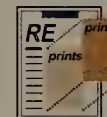


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**Napster,**  
continued from page 1

ing music, images and software over the Internet, creating heavy, bursty traffic patterns on LANs and Internet connections.

"This Napster class of applications can be bandwidth-intensive for small periods of time," explains John McConnell, a Boulder, Colo., consultant specializing in network bandwidth management. "From a network administrator's point of view, you don't know when loads are

coming, how long they will last and what the demand is going to be. . . . If you allow these applications to have uncontrolled access and utilization, you can start starving out your business processes."

That's what happened to Plattsburgh State University, which began blocking Napster last November after the application saturated its outbound Internet bandwidth. Located in upstate New York, the university has two T-1 lines that provide Internet access to dormitory and administrative networks.

Network manager Hap Wheeler recently purchased two Packeteer PacketShapers for about \$10,000 each to control the amount of bandwidth Napster can consume on each network. Wheeler plans to unblock Napster in the fall for the 2,600 students who live on campus.

"What the Packeteer device allows me to do is automatically classify applications . . . to get a list of incoming and outgoing traffic so I can set priorities," Wheeler explains.

Wheeler used PacketShaper to place the highest priority on traffic from the university's online research applications. Below that he rated HTTP traffic for general Web surfing and AOL traffic for e-mail services. Further down were incoming file transfers.

The lowest priority was given to bandwidth-intensive file-sharing applications such as Napster, iMesh, CuteMX and Gnutella. Setting up the PacketShaper was easy, Wheeler says. You just point and click using a Web-based

because Napster traffic reroutes itself to get to its destination. So this spring he bought a PacketShaper to limit the bandwidth available to Napster.

"When Napster started getting popular, the librarians

■ **"With applications like Napster, you can't solve the problem by throwing bandwidth at it."**

Hap Wheeler, network manager, Plattsburgh State University



## The Scoop The news behind the news

### TWO WAYS TO CONTROL 'HOGS'

**A**t the iBAND4 conference in San Francisco next week, network equipment vendors will demonstrate two ways of prioritizing and controlling Napster and other burdensome traffic using products available today.

"Our goal is to show network managers there are ways to manage the bandwidth consumed by an application like Napster rather than turning it off," says Jeffrey Schaeffer, a technical consultant for Hewlett-Packard and organizer of the iBAND4 demonstration.

The first, a rate control approach, identifies troublesome, low-priority applications such as Napster and limits the amount of bandwidth these applications can consume. Usually implemented in network traffic shapers, this approach allows network managers to classify and prioritize different types of traffic on their networks and give each class a predetermined amount of bandwidth.

The second, a Differentiated Services (Diff-Serv) approach, identifies the applications that are the highest priority to an organization and sets the bandwidth requirements for these applications. Low-priority applications such as Napster fight it out among themselves to consume the leftover bandwidth. The Diff-Serv approach requires that applications are marked according to their priority at the server, and that switches, routers and policy managers on the network maintain the priority.

Each approach has pros and cons, according to Schaeffer.

The rate control approach is more common and is available through traffic shapers from Packeteer, Allot Communications and Top Layer Networks that range in price from \$4,500 to \$18,000. These devices let network managers offer access to bandwidth-intensive applications like Napster — albeit at a slower speed — without harming the rest of the applications on the network. However, this approach doesn't respond well to new threats. Like antivirus software, a time lag exists between when a new threat like Napster emerges and when it is implemented in traffic shapers.

The Diff-Serv approach, on the other hand, is not affected by new threats because it focuses on mission-critical applications that have already been identified. However, the Diff-Serv approach is not as precise as rate control. And Diff-Serv is just becoming available in products. Hewlett-Packard introduced policy management software that supports Diff-Serv and rate control about six months ago, but Microsoft didn't begin shipping a Diff-Serv marking capability until this spring with Windows 2000.

Long-term, Diff-Serv may be a more scalable and less expensive approach because it doesn't require special appliances installed throughout the network, Shaeffer says. However, Diff-Serv is not yet supported by ISPs, so use is limited to LANs.

"At HP, we're really convinced that the Diff-Serv model will become very prevalent," Schaeffer says. "Eventually, you'll be able to pay your ISP an extra fee for high-priority traffic and it will be delivered."

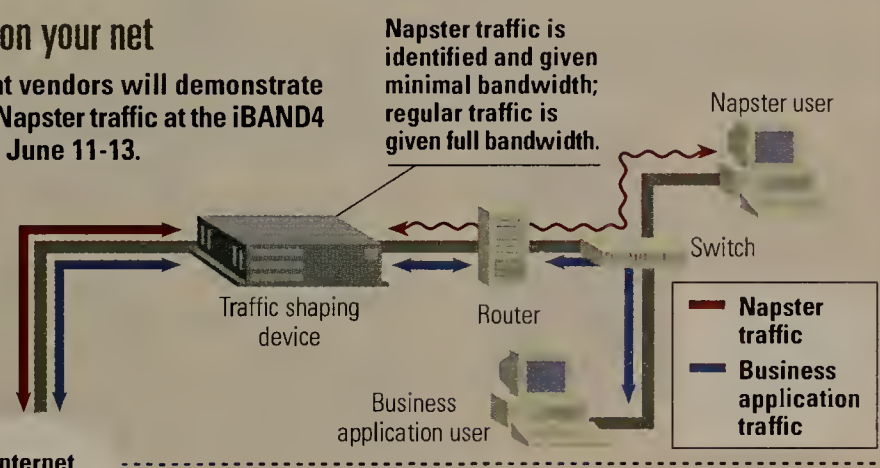
— Carolyn Duffy Marsan

### Living with Napster on your net

Bandwidth management vendors will demonstrate two ways of controlling Napster traffic at the iBAND4 show in San Francisco, June 11-13.

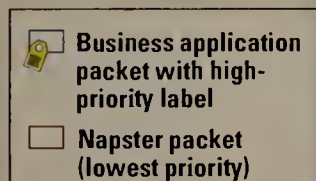
#### 1 Rate Control

This approach uses a traffic shaping device to classify troublesome traffic and control how much bandwidth it receives.



#### 2 Differentiated Services

A second approach identifies mission-critical applications and grants them priority. Other applications battle each other for the remaining bandwidth.



Network devices follow traffic priority rules set by a policy manager and process application traffic faster than untagged Napster packets.



EMA,  
continued from page 1

its mission and deliver tangible services to end users.

"EMA is an industry organization that has been tremendously successful, so successful that e-mail is now ubiquitous," says Gary Rowe, a former EMA board member and now an executive with The Burton Group consulting firm in Midvale, Utah. "Now they have to decide whether to move into another area or just disband. The EMA was all about creating awareness, education and solving industry problems, but those problems have been solved."

The group's acting president and CEO Lauren Haywood says the EMA is committed to moving on, that it is financially viable and is preparing to launch new programs aimed at educating the industry on the role of messaging in e-commerce.

Observers say the job will be difficult because the group is near bankruptcy, a charge the EMA disputes. "We have the money to run the organization, but do we have to be frugal? Yes, we do," says Dave Folsom, secretary and treasurer of the 10-member board of directors. Staffing has been cut by more than half, and board members are taking on extra work. Haywood says she cut \$300,000

out of this year's budget by moving EMA's publications online.

She says the nonprofit group has \$300,000 in cash and \$200,000 in a growing reserve fund.

And the EMA this month is planning to roll out some new programs. The first is the publication of a revised copy of its Privacy Tool Kit, first published in 1991 to help companies develop privacy policies for messaging. The revision reflects today's messaging industry, Haywood says. The kit will be published online and updated quarterly. The EMA also will host the week-long E-business Institute, taught by university professors and focusing on such topics as supply- and value-chain management. EMA also is adding a jobs database to its redesigned Web site.

That's not enough for some observers. "I'm looking for a charter they can get passionate about, something more than a marketing slogan," says Joyce Graff, an analyst with Gartner Group in Stamford, Conn., who co-chaired the EMA's management committee for five years in the mid-'90s. "I haven't seen that spark. What's the unique added value from this organization? Right now it's a 'me too' thing."

Haywood says people are down on the EMA because it is

changing: "We will be different. But look at how the industry has changed. We are headed in the right direction. We are getting our stride back."

That stride was formidable in the mid-'80s and early '90s when the EMA helped draft the Electronic Communications Privacy Act of 1986 and produced the Privacy Tool Kit. It also helped facilitate interoperability between messaging platforms, including X.400.

But the EMA lost its way when the Internet blossomed, and observers question whether the group can interpret the emerging e-commerce market. "When Internet mail and SMTP took off, EMA missed the curve," says one former board member who wished to remain anonymous. "They failed to follow the issues and lost relevance."

"It's sad that with messaging going gangbusters and with over one billion e-mail addresses out there this industry association is in tatters," says Eric Arnum, editor of the Web-based newsletter "Messaging Online."

Critics direct much of the blame for EMA's downward spiral at former CEO Victor Parra, who reportedly bet the organization's reserve fund on building a Comdex-like trade show. Parra was fired in 1997 after EMA depleted a nearly \$1 million reserve fund to stage its

www.nwfusion.com

## BACK TO THE GOOD OL' DAYS

Find out what life was like in the heyday of the Electronic Messaging Association.

DocFinder  
find it 8433 online

stand the facts. I took over after we had just lost nearly \$1 million. I had to rely on what we had in reserve to try and make it better."

Insiders say even after the Philadelphia spending spree, the EMA had money on hand, but that too was lost. By last fall, sources say, the group had depleted its remaining \$800,000 certificate of deposit reserve and had only \$60,000 in cash. "They were living paycheck to paycheck," says another former board member.

Stackpole acknowledges the organization lost money the two years under his leadership. "I was trying to turn the Queen Mary, and we had to try and sustain our programs and services on a tight budget."

The troubles have been a revelation for board members, who also might be accused of taking their eye off the ball.

"The board has become very proactive in watching finances and numbers [for projected show attendance] in hopes of bringing EMA back to health," says Lisa Pratt, vice chairman of the board and a user member from a large Northwest manufacturing company. Pratt says her company is aligned with the new EMA focus on e-business as are other member organizations, including Credit Suisse First Boston and See EMA, page 124

## Rise and fall of a user group

The Electronic Messaging Association began as a powerful industry force to promote e-mail standards. However, the group's influence has waned as e-mail technologies have become simpler and more mainstream.

1983

Mike Cavanagh gathers companies such as IBM, AT&T, CitiBank and ITT to help start the Electronic Messaging Association, with a goal to foster interoperability for e-mail.



1986

EMA is instrumental in drafting the Electronic Communications Privacy Act of 1986, which provided wiretap-like protection for e-mail. The article's author, John Podesta, is now President Clinton's chief of staff.

1993

Cavanagh leaves to start consulting firm, replaced by Bill Moroney.



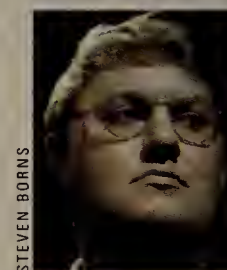
1994

Microsoft leader Bill Gates delivers keynote at EMA conference in Anaheim, Calif.

1995

- Moroney says EMA will take a more prominent role in areas of emerging interest such as public policy, international interoperability standards, e-commerce and Internet applications.

- Torrential rains flood 12th annual conference in New Orleans. EMA pegs attendance at 3,000. Vint Cerf delivers keynote.



1996

Victor Parra becomes president and CEO of EMA. Internet messaging dominates talk at conference in Anaheim, Calif., where nearly 3,000 hear Netscape co-founder Marc Andreessen, left, deliver keynote.

1997

EMA spends association's \$1 million reserve fund on annual conference in Philadelphia, which draws 3,300 attendees. Parra fired reportedly over spending spree.

1998

Netscape's Jim Barksdale delivers keynote at 15th annual conference and exposition in Anaheim, Calif. More than 400 member companies involved in EMA. Kerry Stackpole, right, takes over as CEO.



1999

- Annual conference is held in Dallas with theme of electronic business. The show features "Great Debate" between Lotus, Microsoft and Netscape.
- Steven Layne, CEO of United Messaging, and Ray Murphy, a telecommunications analyst for the United States Navy Federal Credit Union, named to the board of directors in November. Layne resigns four months later.

2000

- Attendance is down at the April show in Boston. EMA pushes its transition to E-Business Forum.
- William Parker, CEO of Digital Impact, is a featured speaker with his talk on online direct marketing.
- Membership lists 277 user and vendor organizations, down from a high of 500 in 1995.



# HOT Companies to Watch @ SUPERCOMM 2000



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# New York bank may breathe life into Iridium

BY JAMES NICCOLAI

Ill-fated Iridium has asked a U.S. bankruptcy court to approve a letter of intent under which New York merchant bank Castle Harlan, Inc. would acquire most of the assets of the failed satellite communications firm.

Terms of the proposed deal call for Castle Harlan to pay \$50 million cash in exchange for the bulk of Iridium's assets, including the company's constellation of 66 communications satellites, its trademarks and trade names, and its Reston, Va., facility, court documents show.

Castle Harlan would pay Iridium an additional \$900,000 per month from the time the court gives its approval for the acquisition until the deal closes.

The bank would also issue Iridium's senior lenders with a 5% equity stake in any successor company that might result from the acquisition. The merchant bank is eyeing the possibility of establishing a new company that would operate and market Iridium's global communications service, Castle Harlan spokesman Charles Storer says.

Castle Harlan apparently

sees an opportunity to turn Iridium's satellite network into a profitable venture, with the likely goal of selling the new company some years down the road. Castle Harlan wouldn't reveal specifics of its business plan. The merchant bank has 45 days to determine whether its plan is viable, and is under no obligation to go ahead with the acquisition, Castle Harlan said in a statement.

Iridium, a \$5 billion venture backed principally by Motorola, filed for Chapter 11 bankruptcy protection in August of last year in Bankruptcy Court for the

Southern District of New York. In March, Iridium announced it had begun to shut down its satellite phone service after failing to find a buyer willing to take on the company's debts, estimated at \$4.4 billion.

Motorola has been maintaining Iridium's satellite network in the interim, although most of the independent gateway companies that connect the satellite network to public telephone networks have switched those gateways off. Limited services are still available in North America and Italy, but Iridium has virtually no customers

remaining, according to Bob Beury, Iridium's deputy general council.

Though some analysts have raised questions about how much life remains in the Iridium network, Beury said today the satellites should remain operational for at least another four years. The gateways could be turned back on at any time, allowing service to be resumed, he added. Castle Harlan isn't the first company to propose buying out Iridium.

*Niccolai is a senior editor with the IDG News Service in San Francisco.*

Java,  
continued from page 8

tual machine, the Kilobyte Virtual Machine (KVM), is for simpler cell phones and embedded systems.

A series of "profiles" will add specific Java APIs, for certain types of devices and markets, to the underlying J2ME software. The soon-to-be-unveiled Mobile Information Device Profile adds HTTP support

and a user interface for the more powerful, larger-screened cell phones or PDAs.

Network connectivity has been evolving slowly for J2ME. CrossRoads' Greco says. His programmers were frustrated by the lack of network features in the earliest version of the KVM for the PalmOS.

Partly to address such concerns, Sun has crafted Java interfaces that will insulate applications from the underlying network protocols, says Eric Shu, a Sun group marketing manager.

Vendors and developers can, in effect, plug in underneath this framework whatever specific net connections their devices need, he says.

The evolution of the software foundation is being matched by a slew of new systems-level boards and specialized Java implementations aimed at device manufacturers. The Java APIs that are part of the J2ME, coupled with the promise of faster processors and Java code execution, are a heady mix for corporate developers.

"When Java, as a lingua franca, is spoken by clients as well as servers, we can then distribute corporate data," says Farooq Butt, a strategic business manager with Motorola. "We can't predict what will happen when Java is unleashed on mobile devices." ■

— By John Cox

## MAKING JAVA APPS ZIPPIER

Among the technologies on display at the JavaOne event this week will be system-level products designed to speed Java applications running on assorted mobile and specialized network devices. Here is a sampling:

- A new Lucent-funded start-up, called SavaJe Technologies, has created an operating system called Jscream that's written in C but is designed to run Java programs on devices using ARM or StrongARM microprocessors. This approach eliminates several layers of software, enabling applications to run faster, says Matthew Catino, president of SavaJe. Jscream uses the full-featured Java 2 Micro Edition Java Virtual Machine (JVM).

- Another start-up, Zucotto Systems of San Diego, has taken this a step further, designing a Java microprocessor to run wireless applications. Company CEO Mark Wells claims applications can run 20 to 40 times faster on its chip than on a software-based JVM. The Espresso Board will be available later this month for use in cell phones and assorted devices using the Bluetooth wireless technology.

- Websprocket will unveil VMFoundry, software that enables users to run Java applications on ARM- and StrongARM-based devices such as cell phones without the need for a Java Virtual Machine. The company has created an open-source version of Java, called Jemini, specifically designed to support such applications.



### JavaOne highlights

What to watch, and watch out for, at JavaOne (<http://java.sun.com/javaone/>):

**Tuesday, June 6, 8:30 a.m.**

Keynote by Sun CEO Scott McNealy, costarring Patricia Sultz, who oversees Java software at Sun. Otherwise known as "The Annual JavaOne Bill Gates Roast."

**Tuesday, June 6, 2:45 p.m.**

"A Web-Based Face Recognition Prototype System Using Java Technology."

**Wednesday, June 7, 8:30 a.m.**

Keynote by Bill Joy and James Gosling, Sun's Java gurus. "The Annual JavaOne Microsoft Windows Roast." Expect Gosling to point out that the Melissa virus affected ONLY Microsoft PCs and software and if everyone had Java the virus wouldn't have spread.

**Thursday, June 8, 9:00 p.m.**

Linux frenzy, including the "Java2 Platform on Linux" birds-of-a-feather session.

**Ongoing**

Preview of the Jiro Technology 1.0 specification in Pavilion Booth #232. This is Java 2-based storage management architecture. Impress your friends by building a Java Bean on the Jiro Runtime Environment, and win a free Jiro logo jacket.

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# DSL vendors to demo interoperability

BY TIM GREENE

DSL vendors will show off interoperability among their equipment this week at SuperComm with interbooth connections that support voice and data.



The demonstrations will simulate DSL connections to customer sites and then link to the public phone network. Calls will then be completed via DSL gear in other show booths.

The point of the demonstrations is to show that customers and service providers can have a choice of equipment when they sign up for or

provision new DSL services. Customers will be able to buy DSL equipment and continue to use it when they switch service providers if interoperability becomes widespread.

Service providers like to have a mix of equipment makers because competition helps drive down costs.

The demonstrations will link data equipment to the Internet using a mix of customer site equipment and DSL access multiplexers, as well as ATM switches.

In addition, telephones will be hooked to DSL customer gear that turns voice into IP packets or ATM cells and forwards it over a DSL link to a voice gateway.

The gateway converts the traffic back to circuit-

switched voice, which is then sent to the public switched telephone network (PSTN). From the PSTN, the traffic is switched to another gateway, which delivers it through yet another gateway, to a DSL-connected phone in another booth.

Among those participating are AccessLAN, Anda, Convergent Networks, CopperCom, Copper Mountain, General Bandwidth, Jetstream, Paradyne, RC Networks, Tekelec, Tachion and Woodwind. ■

**More on what's to come at the SuperComm show Page 10.**

## Napster,

continued from page 119

class and whatever they are targeting is there when they get back to the dorm."

Students at the two colleges should see Napster speed up in the fall, as Muggli plans to add two more T-1s to the campus network. "We were planning on upgrading our lines this summer anyway, but I think the PacketShaper will help us control the bandwidth," Muggli says. "Without something like this, we could buy more and more T-1s, and they'd just keep filling up."

Some colleges are continuing to block Napster because of copyright concerns but are using traffic shapers to control other bandwidth-intensive multimedia applications. For example, Texas Christian University installed an Allot Communications Net Enforcer between the firewall and router on its network, which has four T-1 lines and supports 5,000 students, faculty and staff.

Senior network engineer Jim Mayne says he bought the \$12,000 Allot device in the spring, when the university discovered that 60% to 70% of its traffic was related to MP3 music files. He used the device to give the highest pri-

ority to faculty, staff and laboratory traffic, granting these users a guaranteed minimum bandwidth. He set e-mail, telnet and news traffic as the next priority down. To the dormitory Web traffic, he

increasing his Internet connection to handle up to 12M bit/sec, almost double the current bandwidth. He says the extra bandwidth plus the Allot traffic shaper put him in a good position to manage

## Bandwidth bullies

New bandwidth-intensive Internet applications to watch out for:

Application	Site	Description
Freenet	freenet.sourceforge.net	Distributed system for publishing information over the 'Net.
Gnutella	www.gnutella.wego.com	Protocol for swapping music, software, images and other files.
iMesh	www.imesh.com	Client software for sharing videos, music and other files.
MP3.com	www.mp3.com	Web site offering digital music for downloading or listening.
Napster	www.napster.com	Popular music Web site where users swap MP3 music files.
Scour	www.scour.com	Portal for finding digital music, movies and videos on the Web.

assigned the lowest priority and set bandwidth at 128K bit/sec.

"Napster is currently blocked, and it will stay that way," Mayne says. "We blocked it originally because of the need to gain our bandwidth back, but we'll continue to block it until there's some clear position about its legality."

This summer Mayne is

Gnutella, iMesh and other multimedia applications next fall.

"These new applications create a distributed computing environment across the globe," Mayne says. "It's going to be tremendous in terms of its possibilities, but it's going to be a real headache for people trying to maintain their network properties." ■

# Trend Micro, Network Associates settle dispute

BY JACK MCCARTHY

Antivirus software makers Trend Micro and Network Associates have settled technology patent lawsuits pending against each other and will cross-license their patent portfolios, the firms said last week.

The companies say they hope the settlement, finalized Wednesday, marks an end to the legal dueling over use of patented antivirus technology that has marred relations among antivirus firms in recent years.

"We think the result of this settlement signifies a new era of cooperation among antivirus companies," said Mike Conner, president of Trend Micro North American operations. "We're happy to put the lawsuit behind us and concentrate on our customers."

As part of the settlement, Network Associates will pay Trend Micro \$12.5 million, according to documents filed with the U.S. Securities and Exchange Commission.

Trend Micro sued Network Associates in May 1997 in U.S. District Court in San Jose, alleging infringement of its patents

for antivirus software covering Internet data transfers and e-mail. Network Associates sued Trend Micro last month in U.S. District Court in Dallas, claiming infringement of patents for embedding antivirus technology into Internet and network applications.

Litigation among antivirus companies has been a familiar occurrence in recent years.

Trend Micro settled a patent infringement suit against Symantec in April 1998, with the companies agreeing to cross-license patents, Conner said.

In December 1999, Network Associates and its subsidiary, Cybermedia, came to an agreement with Symantec on copyright, trade secret and unfair competition lawsuits brought against each other.

*McCarthy is a correspondent with IDG News Service in San Francisco.*

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## EMA,

continued from page 120

Chevron.

But the EMA has needed a health checkup for some time and little has been done. In 1998, the EMA's big projects were to develop guidelines for certifying messaging specialists and acting as an observer to a fax interoperability test run by the Internet Mail Consortium. In 1999, the group tried to launch a four-city traveling tutorial but three of the four dates were canceled and money was lost.

Also in that two-year time frame membership was falling and show attendance was off. A record 3,300 people showed up at the annual conference in 1997, but by this year only 1,200 were present, although Arnum and others claim it was half that. At its height, the EMA, which is

unique in that it brings together users and vendors, boasted 500 member organizations, but now lists about half that number.

Participation in the EMA's committees, which investigate topics such as interoperability and standards, has dwindled as members lost interest in issues that have for the most part been resolved.

A move is now underway to reorganize EMA committees into four core groups focused on e-business infrastructure, applications, awareness, and government and legal issues.

But it won't be easy to achieve success. "It's too early to write the EMA's obituary," former CEO Stackpole says. "But they are clearly restructuring and downsizing, and getting into a fighting stance."

"It's sad to see them become irrelevant," Messaging Online's Arnum says. ■



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## CONFERENCE AGENDA

### Sunday, June 18, 2000

12:00pm - 5:00pm

Registration

7:00pm - 9:30pm

Pre-Conference Networking Reception

### Monday, June 19, 2000

8:30am - 9:00am



**Welcome and Opening Overview**

Maryfran Johnson, Editor-in-Chief  
Computerworld

9:00am - 9:45am



**Opening Keynote: "IT Leadership vs. E-Leadership"**

Charlie Feld, E-Leader and former CIO, Delta Airlines  
CEO, The Feld Group

10:00am - 11:30am



**"The Naked Truth About B2B E-Commerce"**

Kevin Fogarty, Business Editor  
Computerworld

*Moderator*

*Panelists:*

Robert Schwartz, VP & GM  
Panasonic Corp.

Kathy Brittain-White, CIO & EVP  
Cardinal Health (cardhealth.com)

Peter Burrows, CTO  
Reebok International

John Keast, CIO/CTO  
NetworkOil

Bruce Carver, VP of Informational  
Management and Technology  
Reynolds & Reynolds

Everybody's talking about business-to-business collaboration as the hottest of the online trends in 2000. But many feel this emperor still has no clothes. This panel will cut through the hype surrounding e-marketplaces, answering some critical questions on the benefits versus the risks. Should your company participate in someone else's B2B marketplace or create your own? When and how do you measure ROI when you're executing at Internet speed? There are multiple decision points for entry into Web-based collaboration, including infrastructure concerns, business application readiness and trust issues between trading partners. As these new business and organizational models evolve, what are the key factors your company must consider? Can it really promote higher sales or lower your production costs? IT leaders from several industries will share their successes and candidly discuss the pitfalls of B2B e-commerce in this interactive session.

11:30am - 12:15pm



**Insider View: "Raytheon Corp.'s Unfolding E-Business Strategy"**

Eric Singleton, Director of Global E-Business  
Raytheon

12:30pm - 1:45pm

Interactive Luncheon with IT Leaders

2:00pm - 3:30pm



**"Enterprise Security: Will Only the Paranoid Survive?"**

Priscilla Tate, President  
Technology Managers Forum

*Moderator*

*Panelists:*

Scott Charney  
former head of computer crime  
investigations, U.S. Department  
of Justice and now Partner  
PricewaterhouseCoopers

Allan Paller  
Columnist, Computerworld  
and Research Director, SANS

Tim Talbot, VP of Technology  
Management, PHH Vehicle  
Management Service

The costs of electronic attacks and security breaches are rising sharply, more than doubling each year into hundreds of millions of dollars. Every week, it seems, a new high-profile victim joins the list of companies that failed to protect themselves and their customers. Never have the business imperatives of secure commerce been so prominently in the spotlight. For IT leaders, the issues go beyond technical concerns. What are your company's legal liabilities when customer data is compromised? How do you get past political wrangling over budget allocations for security products? What are the questions you should be asking inside your own company -- or of your outsourcers or suppliers? This session will explore enterprise security in depth, drawing out examples, ideas and action items from our expert panelists.

3:30pm - 4:15pm



**Afternoon Keynote: "Innovation & Change"**

Thornton May, VP of Research  
Cambridge Technology Partners

4:30pm - 5:30pm

Premier Sponsor Breakout Sessions 1 and 2

5:30pm - 8:30pm

Expo Open and Reception/Buffer Dinner

### Tuesday, June 20, 2000

8:45am - 9:00am

Remarks and Day Two Overview

9:00am - 9:45am



**Keynote**

David Lord, CEO  
Toysmart.com

10:00am - 11:30am



**"ASPs: The Double-Edged Sword of Outsourcing"**

Mark Hall, West Coast Bureau Chief  
Computerworld

*Moderator*

*Panelists:*

Dick Hudson, CIO  
Global Marine

John Voeller, CIO, CTO & SVP  
Black & Veatch

Sateesh Lele, President  
Lele Consulting Group

Tsvi Gal, CIO, CTO & VP of Mergers  
and Acquisitions, GBS

Mark Mathias, President  
Eureka Digital

James Lubinski, EVP  
Galileo International

This latest trend is both an option and an obstacle. As the application service provider market grows beyond the small to medium business space to take advantage of enterprise-class software, IT leaders are considering ASPs as a serious tool in their technology strategies. Yet will these outside vendors offer sufficient security for your IT operations? Can you control point product offerings from ASPs? How do you insure that ASPs deliver on service level agreements? Will today's high-flyers crash to earth and take your company with them? This panel session will nail down the critical success and failure points, and answer the most pressing and provocative questions that ASPs raise for IT executives.

11:30am - 12:15pm



**Featured Speaker**

Peter Solvik, CIO  
Cisco Systems

12:30pm - 2:00pm

Buffet Lunch and Expo Open

2:00pm - 3:30pm



**"Walking the E-Customer Tightrope"**

Julia King, Senior Editor  
Computerworld

*Moderator*

*Panelists:*

Cathy Holka, VP  
National Retail Federation

Joseph Smialowski  
Vice Chairman  
Fleet Boston Financial

Robert Rubin, CIO  
Elf Atochem North America

Manoj Tripathi, CIO and Vice President  
Jamba Juice

Technologies such as data mining and customer relationship management software can put your company right in its customers' pockets, not only anticipating their current needs but discovering new ones. But where does e-business cross over that line between customer knowledge into invasion of privacy? Does your company know how to walk this tightrope without falling off? What are the best strategies for leveraging and managing high-impact business data without alienating customers along the way? How are leading companies using technology to sustain old relationships while developing lucrative new ones? Does online customer service differ from the traditional approach? This panel session will explore the positives and the perils of the customer connection.

3:30pm - 4:15pm



**Insider View: "Taking Care of E-Customers at Autobytel"**

Ann Delligatta, COO  
Autobytel.com

4:15pm - 4:45pm

Premier Sponsor Breakout Session 3

4:45pm - 6:30pm

Expo Open and Reception

7:00pm - 9:00pm



**Premier 100 Awards Presentation and Gala Dinner**

Featured Keynote: Jim Yost, CIO  
Ford Motor Company

### Wednesday, June 21, 2000

8:45am - 9:00am

Remarks and Closing Day Overview

9:00am - 10:30am



**"How to Win the Hiring War Between the 'Dots' and the 'Nots'"**

David Weldon, Careers Editor,  
Computerworld

*Moderator*

*Panelists:*

Irene Dec, VP of International  
Investments, Prudential Insurance Co.

Margaret Schaefer, HR Director  
Kraft Foods

Robert Bruce, CIO  
Allmerica Financial

David Foote, Managing Partner  
Foote Partners LLC

Jim Prev, CIO  
Green Mountain Coffee

Fran Ouitel, Columnist  
Computerworld

Many traditional companies are reeling from the impact of the dot-com drainpipe, as sexy little startups pull top talent from their employee ranks. Beyond the stock options and the thrill of new ventures, what are dot-coms offering that your company may be overlooking? Are you talking about career development, or droning on about employee retention? How can you "steal" from your own staff in other divisions to enrich and strengthen the technology operation? What kind of employee referral programs really work? We'll hear from both sides of the debate in this lively, provocative discussion of hiring, head-hunting and holding onto the best IT people in a sizzling job market.

10:30am - 11:15am



**Closing Keynote: "Putting All the Pieces Together: The E-Management Difference"**

Peter Keen, Author, *The eProcess Edge*, and Chairman  
Keen Education

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## Crazy and customers: More chaos

*"The world is, for the most part, a collective madhouse, and practically everyone, however 'normal' his facade, is faking sanity."*

— John Astin

Customer service is supposed to be your defense against the big, bad world, the thing that stops your company from becoming completely psychotic when flooded with questions that must be answered.

You provide warm bodies and/or an Interactive Voice Response System in an attempt to defuse the incoming problems as quickly as you can while providing the best customer impression possible.

But what happens when customer service becomes bureaucratic and exists simply to allow the representatives to switch off their brains? The answer is chaos.

CompUSA is a fine example of how not to treat customers

and, for that matter, a fine example of chaos. The customer service people are never available and never know anything about whatever it is you're looking for.

Now, following my column "The end of civilization as we know it" (NW, May 8, page 210), reader Steve Claydon wrote with the following observation:

"I know a number of really good, efficient, helpful people at several phone companies. But the further away from the street you go the dumber and less caring they get. That is until you get to the poor people at the customer service and order departments who either obviously don't care, don't get anything at all — ever — or can't trust a single other person to follow through on anything. It all translates to bad management. It's a signal given down the line to protect your own ass and not rock the boat, while 'business as

usual' becomes the rules of engagement, not 'serve the customer.'

"Did you ever call Land's End catalog service? If not, try it. Somebody there really gets it. Everyone on the phone is *trained* carefully. No boiler room answering/order taking. Your order gets to you, and they know how to do e-mail, fax and phone updates on orders. You can track your product delivery — just like the rest of the modern real world that will be the survivors of retail. There is a chain of command. People go to nice school. The customer is always suspected of being right. Can you imagine Pac Bell being like this? No more belligerence, no more missing orders, no more missed installs while you burn your precious time sitting there for a whole day, waiting for someone who never shows.

"Someone has to care. Someone has to know how to inspire people. You do that on one hand by not being a complete jerk to your employees, and on the other hand by rewarding people for getting on the case and staying there. Yes, yes, I know, the union, benefits, hiring problems, etc. . . . But it is not inherently the destiny of every corporation to \*&^% it up so badly. It's a choice."

Thanks Steve, never was a truer word spoken: "It is not inherently the destiny of every corporation to \*&^% it up so badly. It's a choice."

Now why is it we use computers and automation in customer service, girls and boys? Correct! It is to be more efficient, to provide a better customer experience, and not to be too blunt, to save lots of money. But every layer of automation, every inhuman process that drives a human being, erodes the perceived value of customer service to the end user and ultimately to the company.

The time has/will come for us all to consider how far our customer service is from reality. Want to find out how your customer service appears? Call it up yourself and see. You may be driven crazy by what you find.

Service requests to [nwcolumn@gibbs.com](mailto:nwcolumn@gibbs.com).



MARK GIBBS

The latest on the Internet/intranet industry

At a **cookout Saturday**, an IT executive told Buzz he has been harried by planning the logistics of a departmental meeting that will bring colleagues from across the country and Europe to a swanky area hotel. The exec doesn't hold out much hope for the meeting's usefulness — it's his boss' baby — but there is a silver lining:

Most of the associated expenses, you see, will land on my friend's corporate credit card.

"You wouldn't believe the frequent-flier miles and hotel points I'll be getting out of this," he cackled.

Such an anecdote should thrill the entrepreneurs behind **WebMiles**, a customer-rewards start-up that launched its site, [www.webmiles.com](http://www.webmiles.com), earlier this year.

"People do all sorts of crazy things to get frequent-flier miles," says **Jennifer Case**, vice president of marketing at WebMiles, which has attracted an impressive \$41 million from investors such as **NBC, Patricof & Co. Ventures** and **Maritz, Inc.**

Those people doing the crazy things have spoken clearly regarding what works when companies are ladling out goodies to build brand loyalty: "Never mind the trinkets and T-shirts. We want free travel."

So think of WebMiles as a cross between the airline frequent-flier plans and customer-loyalty programs such as "Membership Rewards" from American Express. However, one accumulates WebMiles points not by enduring coast-to-coast red-eyes, but by buying goods and services from a 50-plus-member network of WebMiles-affiliated sites, including **Borders.com, Dell.com, Disneystore.com** and **FTD.com**, as well as old-world merchants such as **Nordstrom** and **Toys "R" Us**. Purchases made with a WebMiles **MasterCard** also earn reward credits; a double-dip if made from an affiliated merchant.

As with frequent-flier miles, WebMiles are redeemed for free air travel. The difference — and this is the start-up's trump card — is that WebMiles can be redeemed for *unrestricted* tickets on *any* airline.

Case says WebMiles will also differentiate itself by letting participants earn free travel faster than other rewards programs.

WebMiles intends to make money by selling the points wholesale to merchants who in turn will distribute them to customers.

The unrestricted tickets should prove popular. And that pile of cash — \$34 million of which was landed *after* the e-comm shake-out began — should give WebMiles a running start on building its brand, especially since NBC's involvement will help with the TV ads.

But no matter how rosy a picture the company paints, the WebMiles accumulation rate is likely to prove disappointing . . . unless, of course, you happen to be planning your company's next off-site meeting.

**Speaking of air travel**, a reader who prefers anonymity offers this observation about plans to put Internet connections on planes:

"I get edgy when it's proposed that someone will place a TV/Internet monitor in front of the face of each airline passenger [on a seat-back] that serves as a cushion in case of emergency," he writes. "In low-speed runway crashes or during turbulence, the passenger can swing forward on the lap belt to smash the display with a human face. This will work wonders for insurance companies, lawyers and plastic surgeons, but not much for travelers, especially babes in arms. Has any ethical person thought this through, or does profit overcome all?"

Interesting point, although I see airline food as a bigger risk.

**Question:** Might the **Federal Communications Commission** consider this "domestic slamming"?

**Mrs. Buzz** recently switched our long-distance service from **AT&T** to **MCIWorldComSprintWhateverThey'reCallingItThisWeek**. She did so without notifying her husband, or, dare I say it, seeking his permission.

A formal complaint to the FCC appears unnecessary, since she swears we're getting a better deal.

Of course, that's what they all say.

You'd like to slam me, too? The address is [buzz@nwu.com](mailto:buzz@nwu.com).



PAUL MCNAMARA





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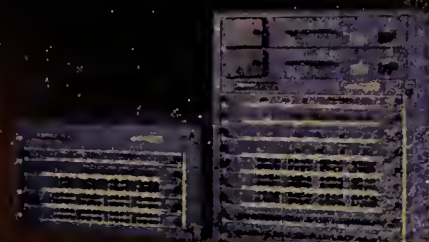
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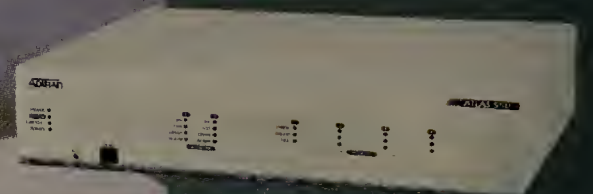
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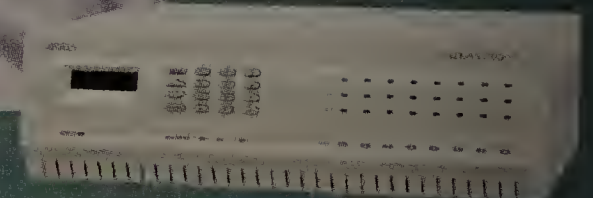


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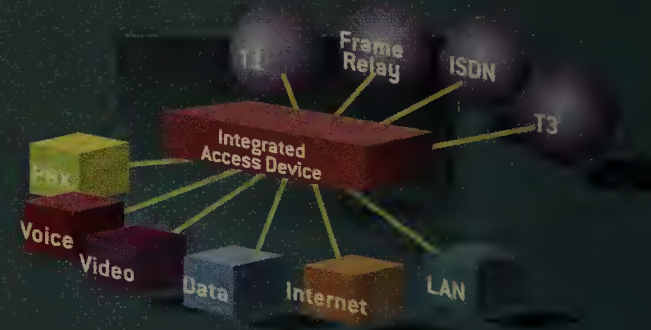


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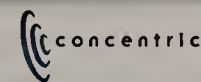
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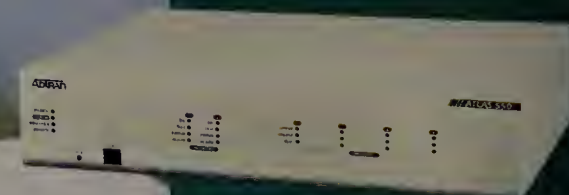
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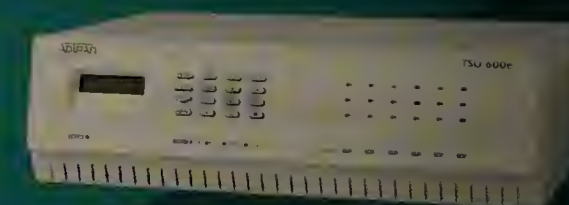
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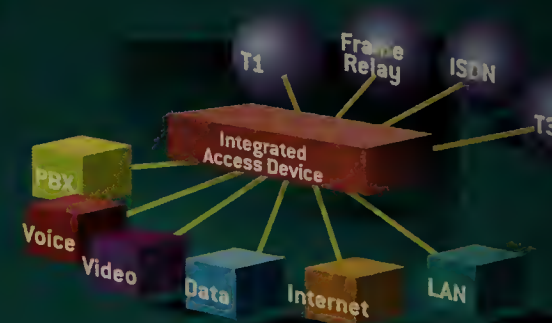
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